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LABOR AND MONOPOLY CAPITAL

The Degradation of Work in the Twentieth Century

by Harry Braverman

Special 144-page issue

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NOTES FROM THE EDITORS

As we have noted before in this space, we are asked to make many more announcements of meetings, publications, etc., in "Notes from the Editors" than we can possibly accommodate. In picking and choosing we try to be guided by two criteria: (1) relatedness to MR and MR Press, and (2) potential interest to MR readers combined with a low probability of their learning of the matter in question elsewhere. Here are a few announcements which seem to meet one or both of these tests:

• Frank Giese and Jim Cronin are among the founders and operators of the United Front Bookstore in Portland, Oregon, which features MR Press books (address: 2266 N.W. Lovejoy St., Portland Ore. 97210). Frank is a professor of French at Portland State University, and Jim (a 1965 graduate of PSU) is a long-time activist in peace and radical movements. They have now been indicted on conspiracy charges in connection with the January 1973 bombings of army and navy recruiting centers in Portland. This is another in the long list of federal conspiracy cases going back to the famous Chicago case of 1968 and including such as the Seattle Seven case, the Harrisburg case, and last winter's VVAW case. So far the government has lost every one of the conspiracy frame-ups, and there is no reason to expect that it will have more success in the Giese-Cronin case. Nevertheless, the government's behavior is not at all irrational from its point of view: these prosecutions harass the Left, immobilize activists, and drain resources which could be put to good use elsewhere. So it is our duty to come to the support of the accused in whatever ways we can. Funds, offers of help, requests for more information should be addressed to the Giese-Cronin Defense Committee, P.O. Box 1186, Portland, Ore. 97207 (telephone: 503-223-7460).

• Another bookstore announcement concerns the P.M. Bookstore, 728 Vallejo St., San Francisco, Calif. 94133 (telephone: 415-989-3089). Until recently P.M. was the only bookstore in the Bay Area specializing in second-hand literature of a Left and socialist character. Now the store has

(Continued on inside back cover)

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The Degradation of Work in the Twentieth Century

by Harry Braverman

Monthly Review
Summer 1974

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Contents

A Note from the Editors vii

Introduction 1

Scientific Management 12

Clerical Workers 48

The Structure of the Working Class and Its Reserve Armies 110

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A Note from the Editors

This summer double issue of *Monthly Review* is devoted to sections of a book that will be published by Monthly Review Press in the fall of this year. It contains somewhat less than a third of the complete book, which consists of an Introduction and twenty chapters divided into five parts as follows:

Part I: Labor and Management

1 Labor and Labor Power
2 The Origins of Management
3 The Division of Labor
4 Scientific Management
5 The Primary Effects of Scientific Management
6 The Habituation of the Worker to the Capitalist Mode of Production

Part II: Science and Mechanization

7 The Scientific-Technical Revolution
8 The Scientific-Technical Revolution and the Worker
9 Machinery
10 Further Effects of Management and Technology on the Distribution of Labor

Part III: Monopoly Capital

11 Surplus Value and Surplus Labor
12 The Modern Corporation
13 The Universal Market
14 The Role of the State

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Part IV: The Growing Working-Class Occupations

15 Clerical Workers
16 Service Occupations and Retail Trade

Part V: The Working Class

17 The Structure of the Working Class and Its Reserve Armies
18 The "Middle Layers" of Employment
19 Productive and Unproductive Labor
20 A Final Note on Skill

The portions excerpted in these pages include a part of the Introduction, and all of Chapter 4 ("Scientific Management"), Chapter 15 ("Clerical Workers"), and Chapter 17 ("The Structure of the Working Class and Its Reserve Armies").

While the book presents a structure of reasoning whose parts are interdependent, we feel that the chapters extracted here may be read independently, and that they will serve to give our readers a fair conception of the argument of the book as a whole. Only occasionally are direct references made to other chapters not reproduced here, and then usually in a context which leaves little doubt about the meaning.

—*The Editors*

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Introduction

This book first took shape in my mind as little more than a study of occupational shifts in the United States. I was interested in the structure of the working class, and the manner in which it had changed. That portion of the population employed in manufacturing and associated industries—the so-called industrial working class—had apparently been shrinking for some time, if not in absolute numbers at any rate in relative terms. Since the details of this process, especially its historical turning points and the shape of the new employment that was taking the place of the old, were not clear to me, I undertook to find out more about them. And since, as I soon discovered, these things had not yet been clarified in any comprehensive fashion, I decided that there was a need for a more substantial historical description and analysis of the process of occupational change than had yet been presented in print.

The more I read in the formal and informal literature of occupations, the more I became aware of a contradiction that marks much of the current writing in this area. On the one hand, it is emphasized that modern work, as a result of the scientific-technical revolution and "automation," requires ever higher levels of education, training, the greater exercise of intelligence and mental effort in general. At the same time, a mounting dissatisfaction with the conditions of industrial and office labor appears to contradict this view. For it is also said—sometimes even by the same people who at other times support the first view—that work has become increasingly subdivided into petty operations that fail to sustain the interest or engage the capacities of humans with current levels of

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education; that these petty operations demand ever less skill and training; and that the modern trend of work by its "mindlessness" and "bureaucratization" is "alienating" ever larger sections of the working population. As generalizations, these two views cannot easily be harmonized. On the other hand, I was not able to find in the vast literature any attempt to reconcile them by careful specification of the manner in which various occupations have evolved, perhaps in contrast to one another.

Thus my interests began to broaden to include the evolution of labor processes *within* occupations as well as the shifts of labor *among* occupations. And as both these varieties of change became gradually clearer in my mind, I was led into the search for the causes, the dynamic underlying the incessant transformation of work in the modern era. In particular, this led me to include in my investigation the evolution of management as well as of technology, of the modern corporation as well as of changes in social life. Before long I found myself attempting a study of the development of the capitalist mode of production during the past hundred years.

The literature which presents and interprets technical and management trends for the general reader exists primarily in two forms: journalism and social science. In the course of a fairly extensive reading of this literature, I was particularly struck by the vagueness, generality of wording, and on occasion egregious errors of description of the concrete matters under discussion. It seemed to me that many widely accepted conclusions were based on little genuine information, and represented either simplifications or outright misreadings of a complex reality. Since much of what appears here will challenge this conventional picture of work and the working population, I feel that I owe the reader an account of my own background insofar as it plays a role in this book. For although I spent on this study the largest part of my spare time during more than four years, my interest in many of the subjects discussed in it dates from many years earlier.

I began my working life by serving a four-year apprentice-

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ship in the coppersmith's trade, and worked at this trade for a total of seven years. These seven years were spent in a naval shipyard, a type of industrial enterprise which, at that time, was probably the most complete product of two centuries of industrial revolution. Almost all the mechanic crafts which had arisen in the course of these centuries (some of which, like my own, were rooted in the handicrafts of classical antiquity and earlier) were practiced in such a shipyard in close association with each other. Because of this propinquity and the interlocking processes practiced by the crafts, and also because of the gathering together of apprentices of all crafts in a trade school for semi-weekly sessions, I learned not only my own trade but gained a concrete understanding of most of the others.

The extremely limited nature of employment in my trade, and its rapid decline with the substitution of new processes and materials for the traditional modes of copper working, made it difficult for me to continue to work as a coppersmith when I moved to other parts of the country or from job to job. But because the trade of working copper provided a foundation in the elements of a number of other crafts, I was always able to find employment in other trades, such as pipefitting, sheet-metal work, and layout, and I did work of these sorts for another seven years: in a railroad repair shop, in sheetmetal shops, and especially in two plants which fabricated heavy steel plate and structural steel into equipment for the basic steel industry, including blast furnaces.

This background of craftsmanship may lead some readers to conclude, after they have read this book, that I have been influenced by a sentimental attachment to the outworn conditions of now-archaic modes of labor. I have been conscious of this possibility, but I have tried not to let any of my conclusions flow from such a romanticism, and on the whole I do not believe that this criticism would be warranted. It is true that I enjoyed, and still enjoy, working as a craftsman, but since I grew up during the years of rapid change in the mechanic crafts, I was always conscious of the

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inexorable march of science-based technological change; moreover, in my reflections upon this subject and in the many discussions among craftsmen debating the "old" and the "new" in which I took part, I was always a modernizer. I believed then, and still believe now, that the transformation of labor processes from their basis in tradition to their basis in science is not only inevitable but necessary for the progress of the human race and for its emancipation from hunger and other forms of need. More important, throughout those years I was an activist in the socialist movement, and I had assimilated the Marxist view which is hostile not to science and technology as such, but only to the manner in which these are used as weapons of domination in the creation, perpetuation, and deepening of a gulf between classes in society.

I had the opportunity of seeing at first hand, during those years, not only the transformation of industrial processes but the manner in which these processes are reorganized; how the worker, systematically robbed of a craft heritage, is given little or nothing to take its place. Like all craftsmen, even the most inarticulate, I always resented this, and as I reread these pages, I find in them a sense not only of social outrage, which was intended, but also perhaps of personal affront. If this is so, it is, as I say, unintended, but I do not think it does any harm. However, I repeat that I hope no one draws from this the conclusion that my views are shaped by nostalgia for an age that cannot be recaptured. Rather, my views about work are governed by nostalgia for an age that has not yet come into being, in which, for the worker, the craft satisfaction that arises from conscious and purposeful mastery of the labor process will be combined with the marvels of science and the ingenuity of engineering, an age in which everyone will be able to benefit, in some degree, from this combination.

In later years, I was able to gain first-hand experience of some of the most typical office processes of our times, again at the moment when they were beginning to undergo rapid changes. Some years of experience in socialist journalism led eventually to my employment in book publishing as an editor,

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and this in turn led to more than a dozen years as an operating executive in two publishing houses. Here I was able to see, and in fact design, some of the administrative processes involved in modern marketing, distributing, accounting, and book production routines; and this experience twice included the transition from conventional to computerized office systems. I would not pretend that this background is as extensive as that of many others who have worked for longer periods of time in larger organizations, but at least it does enable me to understand, in some detail and concreteness, the principles by which labor processes are organized in modern offices.

As the reader will see in the appropriate chapters, I have tried to put this experience to some use in this book. I have also had the benefit of many conversations—with friends, acquaintances, strangers met at social gatherings or while traveling—about their work (and it may be that some of them, if they chance to read this, will now understand why I was curious to the point of rudeness). But while this occupational and conversational background has been useful, I must emphasize that nothing in this book relies upon personal experience or reminiscences, and that I have in the formal sense included almost no factual materials for which I could not give a reference which can be checked independently by the reader, as is proper in any scientific work.

Throughout the period of study and composition, I discussed the ideas that were taking shape in my mind with a number of friends, and I want to thank them here for their interest and patience. The manuscript was also read in draft by friends, associates, and otherwise interested persons, and I must thank them all for valuable suggestions which improved the clarity of presentation of a sometimes complex subject matter, and saved me from some blunders of conception and expression. In particular, I must acknowledge my debt to Paul Sweezy and Harry Magdoff, who were especially helpful in starting me on a number of tracks which I might otherwise have neglected, and in suggesting readings which I might otherwise have missed; but I would like also to add that my

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chief debt to them, and one which I feel most keenly, is the force of their example as Marxists attempting a grasp of modern social reality. My acknowledgments to writers whose work had a special value will be found in the text, footnotes, and reference notes. The intellectual influence under which this work was composed is that of Marx and, as the reader will see, little that has been written by any Marxists since Marx plays a direct role in those portions of this book concerned with the labor process, for reasons which I must now try to explain.

The central place in the first volume of Marx's *Capital* is occupied by the labor process as it takes place under the control of capital, and the subtitle describes it accurately as a "critical analysis of capitalist production." In this volume, the only part of his projected study of capitalism that he was able to realize fully, Marx shows how the processes of production are, in capitalist society, incessantly transformed under the impetus of the principal driving force of that society, the accumulation of capital. For the working population, this transformation manifests itself, first, as a continuous change in the labor processes of each branch of industry, and second, as a redistribution of labor among occupations and industries.

Marx completed this work in the mid-1860s. During the past century this very same dynamic has been far more powerful than the manifestations of it which Marx witnessed in his own lifetime and upon which he based his critical analysis of capitalist production. Yet the extraordinary fact is that Marxists have added little to his body of work in this respect. Neither the changes in productive processes throughout this century of capitalism and monopoly capitalism, nor the changes in the occupational and industrial structure of the working population have been subjected to any comprehensive Marxist analysis since Marx's death. It is for this reason that I cannot, as I have already said, attribute to any Marxists other than Marx himself a strong intellectual influence upon this study: there simply is no continuing body of work in the

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Marxist tradition dealing with the capitalist mode of production in the manner in which Marx treated it in the first volume of *Capital.* Since the reasons for this are bound to be of interest, we must ask why this is so.

The answer probably begins with the extraordinary thoroughness and prescience with which Marx performed his task. He subjected labor processes, and their development in the factory system, to the most knowledgeable and systematic study they have ever received. So well did he understand the tendencies of the capitalist mode of production, and so accurately did he generalize from the as yet meager instances of his own time, that in the decades immediately after he completed his work Marx's analysis seemed adequate to each special problem of the labor process, and remarkably faithful to the overall movement of production. It may thus have been, in the beginning, the very prophetic strength of Marx's analysis that contributed to the dormancy of this subject among Marxists. The development of the factory system seemed to bear out Marx in every particular, and to render superfluous any attempt to repeat what he had already accomplished. It is true that by the early part of the twentieth century the increase in commercial, administrative, and technical labor seemed to cut across Marx's bipolar class structure and introduce a complicating element, and this occasioned a discussion in the Second International and especially in its German section. But the discussion was abortive, in part because the tendencies had not yet ripened sufficiently, and it faded away without conclusive results even while the substance of the problem continued to increase in scope.

Meanwhile, the cataclysmic events of this century—two world wars, fascism, the successive disintegrations and restabilizations of capitalist economies in the aftermaths of wars and in the Great Depression, and revolutions both proletarian and nationalist—dominated the analytical work of Marxism. The front of this violent stage was taken and held by monopoly, militarism, imperialism, nationalism, the "crisis" or "break-

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down" tendencies of the capitalist system, revolutionary strategy, and the problems of the transition from capitalism to socialism.

The extraordinary development of scientific technology, of the productivity of labor, and to some extent of the customary levels of working-class consumption during this century have had, as has often been noted, a profound effect upon the labor movement as a whole. The unionized working class, intimidated by the scale and complexity of capitalist production, and weakened in its original revolutionary impetus by the gains afforded by the rapid increase of productivity, increasingly lost the will and ambition to wrest control of production from capitalist hands and turned ever more to bargaining over labor's share in the product. This labor movement formed the immediate environment of Marxism; and Marxists were, in varying degrees, compelled to adapt themselves to it.

The adaptation took various forms, many of which can now be seen as ideologically destructive. The working philosophy of Marxism, as distinguished from its holiday pronouncements, focused increasingly not upon the profound inner nature of capitalism and the worker's position within it, but upon its various conjunctural effects and crises. In particular, the critique of the mode of production gave way to the critique of capitalism as a mode of distribution. Impressed, perhaps even overawed, by the immense productivity of the labor process, baffled by its increasing scientific intricacy, participating in the struggles of workers for improvements in wages, hours, and conditions, Marxists adapted to the view of the modern factory as an inevitable if perfectible form of the organization of the labor process. In the Social Democracy, the pre-World-War-I socialist movement, the evolution of unions and Marxist parties went hand in hand, as part of the close association between the two and their joint drift toward a thoroughly nonrevolutionary outlook.

The revival of revolutionary Marxism in the Communist movement after the Russian Revolution arrested the drift toward reformism in many other fields but seems only to have

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exacerbated it in this respect. The Soviet Communists had taken power, in a turn of history unexpected by classical Marxism, in a barely capitalist country where, except in a few industrial centers, technology, production, and even mere organized and disciplined labor processes were weak. The Soviet Union faced catastrophe unless it could develop production and replace the slothful traditions of the Russian peasantry with systematic habits of social labor. In this situation, the respect and even admiration of Marxists for the scientific technology, the production system, and the organized and regularized labor processes of developed capitalism was if anything heightened. If the old Social Democracy tended to view the capitalist mode of production as an immensely powerful and successful enterprise with which it was necessary to compromise, the Communists tended to view it with equal awe as a source from which it was necessary to learn and borrow, and which would have to be imitated if the Soviet Union were to catch up with capitalism and lay the foundations for socialism.

We need only recall that Lenin himself repeatedly urged the study of Frederick W. Taylor's "scientific management," with an eye toward utilizing it in Soviet industry. The Taylor system, he said, "like all capitalist progress, is a combination of the refined brutality of bourgeois exploitation and a number of the greatest scientific achievements in the field of analysing mechanical motions during work, the elimination of superfluous and awkward motions, the elaboration of correct methods of work, the introduction of the best system of accounting and control, etc. The Soviet Republic must at all costs adopt all that is valuable in the achievements of science and technology in this field. The possibility of building socialism depends exactly upon our success in combining the Soviet power and the Soviet organisation of administration with the up-to-date achievements of capitalism. We must organise in Russia the study and teaching of the Taylor system and systematically try it out and adapt it to our ends." [1] In practice, Soviet industrialization imitated the capitalist model;

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and as industrialization advanced the structure lost its provisional character and the Soviet Union settled down to an organization of labor differing only in details from that of the capitalist countries, so that the Soviet working population bears all the stigmata of the Western working classes. In the process, the ideological effect was felt throughout world Marxism: the technology of capitalism, which Marx had treated with cautious reserve, and the organization and administration of labor, which he had treated with passionate hostility, became relatively acceptable. Now the revolution against capitalism was increasingly conceived as a matter of stripping from the highly productive capitalist mechanism certain "excrescences," improving the conditions of work, adding to the factory organization a formal structure of "workers' control," and replacing the capitalist mechanisms of accumulation and distribution with socialist planning.

At any rate and whatever the precise factors at work, the critique of the capitalist mode of production, originally the most trenchant weapon of Marxism, gradually lost its cutting edge as the Marxist analysis of the class structure of society failed to keep pace with the rapid process of change. It has now become a commonplace to assert that Marxism was adequate only for the definition of the "industrial proletariat," and that with the relative shrinkage of that proletariat in size and social weight, Marxism, at least in this respect, has become "outmoded." As a result of this uncorrected obsolescence, Marxism became weakest at the very point where it had originally been strongest.

During the past decade there has been a renewal of interest on the Left in work processes and the ways in which they are organized. This may be attributed to a number of causes. The headlong rush of capital accumulation which has proceeded relatively without check since World War II in Western Europe, the United States, and Japan has removed from the center of radical attention those notions of the imminent "breakdown" and "collapse" of the capitalist system which dominated radical thought during the decades following

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World War I. The bankruptcy of Soviet Communist ideology has opened the way for a neo-Marxism which has attempted fresh approaches to the problems of capitalism and socialism. In particular, the discussions of the organization of labor in Cuba in the mid-sixties, and the Cultural Revolution in China shortly thereafter, went beyond the preoccupation with the equalitarian distribution of the products of social labor and brought to the fore the idea of a revolution in the organization of social production. And finally, the new wave of radicalism of the 1960s was animated by its own peculiar and in some ways unprecedented concerns. Since the discontents of youth, intellectuals, feminists, ghetto populations, etc., were produced not by the "breakdown" of capitalism but by capitalism functioning at the top of its form, so to speak, working at its most rapid and energetic pace, the focus of rebellion was now somewhat different from that of the past. At least in part, dissatisfaction centered not so much on capitalism's inability to provide work as on the work it provides, not on the collapse of its productive processes but on the appalling effects of these processes at their most "successful." It is not that the pressures of poverty, unemployment, and want have been eliminated—far from it—but rather that these have been supplemented by a discontent which cannot be touched by providing more prosperity and jobs because these are the very things that produced this discontent.

Notes

1. V. I. Lenin, "The Immediate Tasks of the Soviet Government" (1918), *Collected Works*, vol. 27 (Moscow, 1965), p. 259.

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Scientific Management

The classical economists were the first to approach the problems of the organization of labor within capitalist relations of production from a theoretical point of view. They may thus be called the first management experts, and their work was continued in the latter part of the Industrial Revolution by such men as Andrew Ure and Charles Babbage. Between these men and the next step, the comprehensive formulation of management theory in the late nineteenth and early twentieth centuries, there lies a gap of more than half a century during which there was an enormous growth in the size of enterprises, the beginnings of the monopolistic organization of industry, and the purposive and systematic application of science to production. The scientific management movement initiated by Frederick Winslow Taylor in the last decades of the nineteenth century was brought into being by these forces. Logically, Taylorism belongs to the chain of development of management methods and the organization of labor, and not to the development of technology, in which its role was minor.*

Scientific management, so-called, is an attempt to apply the methods of science to the increasingly complex problems of the control of labor in rapidly growing capitalist enterprises. It lacks the characteristics of a true science because its assump-

* It is important to grasp this point, because from it flows the universal application of Taylorism to work in its various forms and stages of development, regardless of the nature of the technology employed. Scientific management, says Peter F. Drucker, "was not concerned with technology. Indeed, it took tools and techniques largely as given." [1]

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tions reflect nothing more than the outlook of the capitalist with regard to the conditions of production. It starts, despite occasional protestations to the contrary, not from the human point of view but from the capitalist point of view, from the point of view of the management of a refractory work force in a setting of antagonistic social relations. It does not attempt to discover and confront the cause of this condition, but accepts it as an inexorable given, a "natural" condition. It investigates not labor in general, but the adaptation of labor to the needs of capital. It enters the workplace not as the representative of science, but as the representative of management masquerading in the trappings of science.

A comprehensive and detailed outline of the principles of Taylorism is essential to our narrative, not because of the things for which it is popularly known—stopwatch, speed-up, etc.—but because behind these commonplaces there lies a theory which is nothing less than the explicit verbalization of the capitalist mode of production. But before I begin this presentation, a number of introductory remarks are required to clarify the role of the Taylor school in the development of management theory.

It is impossible to overestimate the importance of the scientific management movement in the shaping of the modern corporation and indeed all institutions of capitalist society which carry on labor processes. The popular notion that Taylorism has been "superseded" by later schools of industrial psychology or "human relations," that it "failed"—because of Taylor's amateurish and naive views of human motivation or because it brought about a storm of labor opposition or because Taylor and various successors antagonized workers and sometimes management as well—or that it is "outmoded" because various Taylorian specifics like functional foremanship or his incentive-pay schemes have been discarded for more sophisticated methods: all these represent a woeful misreading of the actual dynamics of the development of management.

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Taylor dealt with the fundamentals of the organization of the labor process and of control over it. The later schools of Hugo Münsterberg, Elton Mayo, and others of this type dealt primarily with the adjustment of the worker to the ongoing production process as that process was designed by the industrial engineer. The successors to Taylor are to be found in engineering and work design, and in top management; the successors to Münsterberg and Mayo are to be found in personnel departments and schools of industrial psychology and sociology. Work itself is organized according to Taylorian principles, while personnel departments and academics have busied themselves with the selection, training, manipulation, pacification, and adjustment of "manpower" to suit the work processes so organized. Taylorism dominates the world of production; the practitioners of "human relations" and "industrial psychology" are the maintenance crew for the human machinery. If Taylorism does not exist as a separate school today, that is because, apart from the bad odor of the name, it is no longer the property of a faction, since its fundamental teachings have become the bedrock of all work design.* Peter F. Drucker, who has the advantage of considerable direct experience as a management consultant, is emphatic on this score:

> Personnel Administration and Human Relations are the things talked about and written about whenever the management of worker and work is being discussed. They are the things the Personnel Department concerns itself with. But they are not the concepts that underlie the actual management of worker and work in American industry. This concept is Scientific Management. Scientific Management focuses on the work. Its

* "As a separate movement," says George Soule, "it virtually disappeared in the great depression of the 1930's, but by that time knowledge of it had become widespread in industry and its methods and philosophy were commonplaces in many schools of engineering and business management." [2] In other words, Taylorism is "outmoded" or "superseded" only in the sense that a sect which has become generalized and broadly accepted disappears as a sect.

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> core is the organized study of work, the analysis of work into its simplest elements and the systematic improvement of the worker's performance of each of these elements. Scientific Management has both basic concepts and easily applicable tools and techniques. And it has no difficulty proving the contribution it makes; its results in the form of higher output are visible and readily measurable.
>
> Indeed, Scientific Management is all but a systematic philosophy of worker and work. Altogether it may well be the most powerful as well as the most lasting contribution America has made to Western thought since the Federalist Papers.[3]

The use of experimental methods in the study of work did not begin with Taylor; in fact, the self-use of such methods by the craftsman is part of the very practice of a craft. But the study of work by or on behalf of those who manage it rather than those who perform it seems to have come to the fore only with the capitalist epoch; indeed, very little basis for it could have existed before. The earliest references to the study of work correspond to the beginnings of the capitalist era: such a reference, for example, is found in the *History of the Royal Society of London*, and dates from the middle of the seventeenth century. We have already mentioned the classical economists. Charles Babbage, who not only wrote penetrating discussions of the organization of the labor process in his day, but applied the same concept to the division of mental labor, and who devised an early calculating "engine," was probably the most direct forerunner of Taylor, who must have been familiar with Babbage's work even though he never referred to it. France had a long tradition of attempting the scientific study of work, starting with Louis XIV's minister Colbert; including military engineers like Vauban and Belidor and especially Coulomb, whose physiological studies of exertion in labor are famous, through Marey, who used smoked paper cylinders to make a graphic record of work phenomena; and culminating in Henri Fayol, a contemporary of Taylor, who in his *General and Industrial Management* attempted a set of principles aimed at securing total enterprise control by way of a systematic

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approach to administration.[4] The publication of management manuals, the discussions of the problems of management, and the increasingly sophisticated approach taken in practice in the second half of the nineteenth century lend support to the conclusion of the historians of the scientific management movement that Taylor was the culmination of a pre-existing trend: "What Taylor did was not to invent something quite new, but to synthesize and present as a reasonably coherent whole ideas which had been germinating and gathering force in Great Britain and the United States throughout the nineteenth century. He gave to a disconnected series of initiatives and experiments a philosophy and a title." [5]

Taylor has little in common with those physiologists or psychologists who have attempted, before or after him, to gather information about human capacities in a spirit of scientific interest. Such records and estimates as he did produce are crude in the extreme, and this has made it easy for such critics as Georges Friedmann to poke holes in his various "experiments" (most of which were not intended as experiments at all, but as forcible and hyperbolic demonstrations). Friedmann treats Taylorism as though it were a "science of work," where in reality it is intended to be a *science of the management of others' work* under capitalist conditions.[6] It is not the "best way" to do work "in general" that Taylor was seeking, as Friedmann seems to assume, but an answer to the specific problem of how best to control alienated labor—that is to say, labor power that is bought and sold.

The second distinctive feature of Taylor's thought was his concept of control. Control has been the essential feature of management throughout its history, but with Taylor it assumed unprecedented dimensions. The stages of management control over labor before Taylor had included, progressively: the gathering together of the workers in a workshop and the dictation of the length of the working day; the supervision of workers to ensure diligent, intense, or uninterrupted application; the enforcement of rules against distractions (talking, smoking, leaving the workplace, etc.) that were

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thought to interfere with application; the setting of production minimums; etc. A worker is under management control when subjected to these rules, or to any of their extensions and variations. But Taylor raised the concept of control to an entirely new plane when he asserted as an *absolute necessity for adequate management the dictation to the worker of the precise manner in which work is to be performed.* That management had the right to "control" labor was generally assumed before Taylor, but in practice this right usually meant only the general setting of tasks, with little direct interference in the worker's mode of performing them. Taylor's contribution was to overturn this practice and replace it by its opposite. Management, he insisted, could be only a limited and frustrated undertaking so long as it left to the worker any decision about the work. His "system" was simply a means for management to achieve control of the actual mode of performance of every labor activity, from the simplest to the most complicated. To this end, he pioneered a far greater revolution in the division of labor than any that had gone before.

Taylor created a simple line of reasoning and advanced it with a logic and clarity, a naive openness, and an evangelical zeal which soon won him a strong following among capitalists and managers. His work began in the 1880s but it was not until the 1890s that he began to lecture, read papers, and publish results. His own engineering training was limited, but his grasp of shop practice was superior, since he had served a four-year combination apprenticeship in two trades, those of patternmaker and machinist. The spread of the Taylor approach was not limited to the United States and Britain; within a short time it became popular in all industrial countries. In France it was called, in the absence of a suitable word for management, "l'organisation scientifique du travail" (later changed, when the reaction against Taylorism set in, to "l'organisation rationnelle du travail"). In Germany it was known simply as *rationalization;* the German corporations were probably ahead of everyone else in the practice of this technique, even before World War I.[7]

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Taylor was the scion of a well-to-do Philadelphia family. After preparing for Harvard at Exeter he suddenly dropped out, apparently in rebellion against his father, who was directing Taylor toward his own profession, the law. He then took the step, extraordinary for anyone of his class, of starting a craft apprenticeship in a firm whose owners were social acquaintances of his parents. When he had completed his apprenticeship, he took a job at common labor in the Midvale Steel Works, also owned by friends of his family and technologically one of the most advanced companies in the steel industry. Within a few months he had passed through jobs as clerk and journeyman machinist, and was appointed gang boss in charge of the lathe department.

In his psychic makeup, Taylor was an exaggerated example of the obsessive-compulsive personality: from his youth he had counted his steps, measured the time for his various activities, and analyzed his motions in a search for "efficiency." Even when he had risen to importance and fame, he was still something of a figure of fun, and his appearance on the shop floor produced smiles. The picture of his personality that emerges from a study recently done by Sudhir Kakar justifies calling him, at the very least, a neurotic crank.[8] These traits fitted him perfectly for his role as the prophet of modern capitalist management, since that which is neurotic in the individual is, in capitalism, normal and socially desirable for the functioning of society.

Shortly after Taylor became gang boss, he entered upon a struggle with the machinists under him. Because this struggle was a classic instance of the manner in which the antagonistic relations of production express themselves in the workplace, not only in Taylor's time but before and after, and since Taylor drew from this experience the conclusions that were to shape his subsequent thinking, it is necessary to quote at length here from his description of the events.* The following

* Extracts of considerable length from Taylor's several writings will appear in this chapter. This is because Taylor is still the most useful source

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account, one of several he gave of the battle, is taken from his testimony, a quarter-century later, before a Special Committee of the U.S. House of Representatives:

> Now, the machine shop of the Midvale Steel Works was a piecework shop. All the work practically was done on piecework, and it ran night and day—five nights in the week and six days. Two sets of men came on, one to run the machines at night and the other to run them in the daytime.
>
> We who were the workmen of that shop had the quantity output carefully agreed upon for everything that was turned out in the shop. We limited the output to about, I should think, one-third of what we could very well have done. We felt justified in doing this, owing to the piecework system—that is, owing to the necessity for soldiering under the piecework system—which I pointed out yesterday.
>
> As soon as I became gang boss the men who were working under me and who, of course, knew that I was onto the whole game of soldiering or deliberately restricting output, came to me at once and said, "Now, Fred, you are not going to be a damn piecework hog, are you?"
>
> I said, "If you fellows mean you are afraid I am going to try to get a larger output from these lathes," I said, "Yes; I do propose to get more work out." I said, "You must remember I have been square with you fellows up to now and worked with you. I have not broken a single rate. I have been on your side of the fence. But now I have accepted a job under the management of this company and I am on the other side of the fence, and I will tell you perfectly frankly that I am going to try to get a bigger output from those lathes." They answered, "Then, you are going to be a damned hog."

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for any study of scientific management. In the storms of opposition that followed Taylorism, few ventured to put the case so baldly as did Taylor, in his naive assumption that all reasonable people, including workers, would see the supreme rationality of his argument and accede to it. What he avows openly are the now-unacknowledged private assumptions of management. On the other hand, most of the academic commentators on Taylor are of limited usefulness, since everything that is so clear in Taylor becomes blurred or misunderstood. Kakar's book is a useful exception, despite his conventional conclusion that "with Taylor's ends there is no quarrel."

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I said, "Well, if you fellows put it that way, all right." They said, "We warn you, Fred, if you try to bust any of these rates, we will have you over the fence in six weeks." I said, "That is all right; I will tell you fellows again frankly that I propose to try to get a bigger output off these machines."

Now, that was the beginning of a piecework fight that lasted for nearly three years, as I remember it—two or three years—in which I was doing everything in my power to increase the output of the shop, while the men were absolutely determined that the output should not be increased. Anyone who has been through such a fight knows and dreads the meanness of it and the bitterness of it. I believe that if I had been an older man—a man of more experience—I should have hardly gone into such a fight as this—deliberately attempting to force the men to do something they did not propose to do.

We fought on the management's side with all the usual methods, and the workmen fought on their side with all their usual methods. I began by going to the management and telling them perfectly plainly, even before I accepted the gang boss-ship, what would happen. I said, "Now these men will show you, and show you conclusively, that, in the first place, I know nothing about my business; and that in the second place, I am a liar, and you are being fooled, and they will bring any amount of evidence to prove these facts beyond a shadow of a doubt." I said to the management, "The only thing I ask you, and I must have your firm promise, is that when I say a thing is so you will take my word against the word of any 20 men or any 50 men in the shop." I said, "If you won't do that, I won't lift my finger toward increasing the output of this shop." They agreed to it and stuck to it, although many times they were on the verge of believing I was both incompetent and untruthful.

Now, I think it perhaps desirable to show the way in which that fight was conducted.

I began, of course, by directing some one man to do more work than he had done before, and then I got on the lathe myself and showed him that it could be done. In spite of this, he went ahead and turned out exactly the same old output and refused to adopt better methods or to work quicker until finally I laid him off and got another man in his place. This new man—I could not blame him in the least under the circum-

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stances—turned right around and joined the other fellows and refused to do any more work than the rest. After trying this policy for a while and failing to get any results I said distinctly to the fellows, "Now, I am a mechanic; I am a machinist. I do not want to take the next step, because it will be contrary to what you and I look upon as our interest as machinists, but I will take it if you fellows won't compromise with me and get more work off of these lathes, but I warn you if I have to take this step it will be a durned mean one." I took it.

I hunted up some especially intelligent laborers who were competent men, but who had not had the opportunity of learning a trade, and I deliberately taught these men how to run a lathe and how to work right and fast. Every one of these laborers promised me, "Now, if you will teach me the machinist's trade, when I learn to run a lathe I will do a fair day's work," and every solitary man, when I had taught them their trade, one after another turned right around and joined the rest of the fellows and refused to work one bit faster.

That looked as if I were up against a stone wall, and for a time I was up against a stone wall. I did not blame even these laborers in my heart, my sympathy was with them all of the time, but I am telling you the facts as they then existed in the machine shops of this country, and in truth, as they still exist.

When I had trained enough of these laborers so that they could run the lathes, I went to them and said, "Now, you men to whom I have taught a trade are in a totally different position from the machinists who were running these lathes before you came here. Every one of you agreed to do a certain thing for me if I taught you a trade, and now not one of you will keep his word. I did not break my word with you, but every one of you has broken his word with me. Now, I have not any mercy on you; I have not the slightest hesitation in treating you entirely differently from the machinists." I said, "I know that very heavy social pressure has been put upon you outside the works to keep you from carrying out your agreement with me, and it is very difficult for you to stand out against this pressure, but you ought not to have made your bargain with me if you did not intend to keep your end of it. Now, I am going to cut your rate in two tomorrow and you are going to work for half price from now on. But all you will have to do is to turn out a fair day's work and you can earn better wages than you have been earning."

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These men, of course, went to the management, and protested that I was a tyrant, and a nigger driver, and for a long time they stood right by the rest of the men in the shop and refused to increase their output a particle. Finally, they all of a sudden gave right in and did a fair day's work.

I want to call your attention, gentlemen, to the bitterness that was stirred up in this fight before the men finally gave in, to the meanness of it, and the contemptible conditions that exist under the old piecework system, and to show you what it leads to. In this contest, after my first fighting blood which was stirred up through strenuous opposition had subsided, I did not have any bitterness against any particular man or men. My anger and hard feelings were stirred up against the system; not against the men. Practically all of those men were my friends, and many of them are still my friends.* As soon as I began to be successful in forcing the men to do a fair day's work, they played what is usually the winning card. I knew that it was coming. I had predicted to the owners of the company what would happen when we began to win, and had warned them that they must stand by me; so that I had the backing of the company in taking effective steps to checkmate the final move of the men. Every time I broke a rate or forced one of the new men whom I had trained to work at a reasonable and proper speed, some one of the machinists would deliberately break some part of his machine as an object lesson to demonstrate to the management that a fool foreman was driving the men to overload their machines until they broke. Almost every day ingenious accidents were planned, and these happened to machines in different parts of the shop, and were, of course, always laid to the fool foreman who was driving the men and the machines beyond their proper limit.

Fortunately, I had told the management in advance that this would happen, so they backed me up fully. When they began breaking their machines, I said to the men, "All right; from this time on, any accident that happens in this shop, every time you break any part of a machine you will have to pay part of the

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* This particular bit of mythomania was typical of the man; there was apparently no truth to it. Kakar calls it "characteristic of the obsessional personality." [9]

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> cost of repairing it or else quit. I don't care if the roof falls in and breaks your machine, you will pay all the same." Every time a man broke anything I fined him and then turned the money over to the mutual benefit association, so that in the end it came back to the men. But I fined them, right or wrong. They could always show every time an accident happened that it was not their fault and that it was an impossible thing for them not to break their machine under the circumstances. Finally, when they found that these tactics did not produce the desired effect on the management, they got sick and tired of being fined, their opposition broke down, and they promised to do a fair day's work.
>
> After that we were good friends, but it took three years of hard fighting to bring this about.[10]

The issue here turned on the work content of a day's labor power, which Taylor defines in the phrase "a fair day's work." To this term he gave a crude physiological interpretation: all the work a worker can do without injury to his health, at a pace that can be sustained throughout a working lifetime. (In practice, he tended to define this level of activity at an extreme limit, choosing a pace that only a few could maintain, and then only under strain.) Why a "fair day's work" should be defined as a physiological maximum is never made clear. In attempting to give concrete meaning to the abstraction "fairness," it would make just as much if not more sense to express a fair day's work as the amount of labor necessary to add to the product a value equal to the worker's pay; under such conditions, of course, profit would be impossible. The phrase "a fair day's work" must therefore be regarded as inherently meaningless, and filled with such content as the adversaries in the purchase-sale relationship try to give it.

Taylor set as his objective the maximum or "optimum" that can be obtained from a day's labor power. "On the part of the men," he said in his first book, "the greatest obstacle to the attainment of this standard is the slow pace which they adopt, or the loafing or 'soldiering,' marking time, as it is called." In each of his later expositions of his system, he begins with this

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same point, underscoring it heavily.[11] The causes of this soldiering he breaks into two parts: "This loafing or soldiering proceeds from two causes. First, from the natural instinct and tendency of men to take it easy, which may be called *natural soldiering*. Second, from more intricate second thought and reasoning caused by their relations with other men, which may be called *systematic soldiering*." The first of these he quickly puts aside, to concentrate on the second: "The natural laziness of men is serious, but by far the greatest evil from which both workmen and employers are suffering is the *systematic soldiering* which is almost universal under all the ordinary schemes of management and which results from a careful study on the part of the workmen of what they think will promote their best interests."

> The greater part of systematic soldiering . . . is done by the men with the deliberate object of keeping their employers ignorant of how fast work can be done.
>
> So universal is soldiering for this purpose, that hardly a competent workman can be found in a large establishment, whether he works by the day or on piece work, contract work or under any of the ordinary systems of compensating labor, who does not devote a considerable part of his time to studying just how slowly he can work and still convince his employer that he is going at a good pace.
>
> The causes for this are, briefly, that practically all employers determine upon a maximum sum which they feel it is right for each of their classes of employés to earn per day, whether their men work by the day or piece.[12]

That the pay of labor is a socially determined figure, relatively independent of productivity, among employers of similar types of labor power in any given period was thus known to Taylor. Workers who produce twice or three times as much as they did the day before do not thereby double or triple their pay, but may be given a small incremental advantage over their fellows, an advantage which disappears as their level of production becomes generalized. The contest over the size of the portion of the day's labor power to be

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embodied in each product is thus relatively independent of the level of pay, which responds chiefly to market, social, and historical factors. The worker learns this from repeated experiences, whether working under day or piece rates: "It is, however," says Taylor, "under piece work that the art of systematic soldiering is thoroughly developed. After a workman has had the price per piece of the work he is doing lowered two or three times as a result of his having worked harder and increased his output, he is likely to entirely lose sight of his employer's side of the case and to become imbued with a grim determination to have no more cuts if soldiering can prevent it." [13] To this it should be added that even where a piecework or "incentive" system allows the worker to increase his pay, the contest is not thereby ended but only exacerbated, because the output records now determine the setting and revision of pay rates.

Taylor always took the view that workers, by acting in this fashion, were behaving rationally and with an adequate view of their own best interests. He claimed, in another account of his Midvale battle, that he conceded as much even in the midst of the struggle: "His workman friends came to him [Taylor] continually and asked him, in a personal, friendly way, whether he would advise them, for their own best interest, to turn out more work. And, as a truthful man, he had to tell them that if he were in their place he would fight against turning out any more work, just as they were doing, because under the piece-work system they would be allowed to earn no more wages than they had been earning, and yet they would be made to work harder." [14] *

* In this respect, the later industrial sociologists took a step backward from Taylor. Rather than face the fact of a conflict of interests, they interpreted the behavior of workers in refusing to work harder and earn more under piece rates as "irrational" and "noneconomic" behavior, in contrast to that of management, which always behaved rationally. And this despite the fact that, in the observations made at the Hawthorne plant of Western Electric from which the "human relations" school emerged, the "lowest producer in the room ranked first in intelligence and third in

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The conclusions which Taylor drew from the baptism by fire he received in the Midvale struggle may be summarized as follows: Workers who are controlled only by general orders and discipline are not adequately controlled, because they retain their grip on the actual processes of labor. So long as they control the labor process itself, they will thwart efforts to realize to the full the potential inherent in their labor power. To change this situation, control over the labor process must pass into the hands of management, not only in a formal sense but by the control and dictation of each step of the process, including its mode of performance. In pursuit of this end, no pains are too great, no efforts excessive, because the results will repay all efforts and expenses lavished on this demanding and costly endeavor.*

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dexterity; the highest producer in the room was seventh in dexterity and lowest in intelligence." [15]

At least one economist, William M. Leiserson, has given a proper judgment on workers' rationality in this connection: ". . . the same conditions that lead businessmen to curtail production when prices are falling, and to cut wages when labor efficiency is increasing, cause workers to limit output and reduce efficiency when wages are increasing. . . . If the workers' reasoning is wrong, then business economics as it is taught by employers and the business practices of modern industry generally must be equally wrong." [16] The Hawthorne investigators thought, and their followers still think, that the Western Electric workers were "irrational" or motivated by "group" or "social" or other "emotional" considerations in holding their output down, despite the fact that these very Hawthorne investigations were brought to an end by the Western Electric layoffs in the Great Depression of the 1930s, thus demonstrating just how rational the workers' fears were.

One of the most interesting inquiries into this subject was done in the late 1940s by a sociologist at the University of Chicago who took a job in a factory. He studied intensively eighty-four workers, and found among them only nine "rate busters," who were "social isolates" not only on the job but off; eight of the nine were Republicans while the shop was 70 percent Democratic, and all were from farm or middle-class backgrounds while the rest of the shop was predominantly working-class in family history.[17]

* Clearly, this last conclusion depends on Adam Smith's well-known principle that the division of labor is limited by the extent of the market, and Taylorism cannot become generalized in any industry or applicable in

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The forms of management that existed prior to Taylorism, which Taylor called "ordinary management," he deemed altogether inadequate to meet these demands. His descriptions of ordinary management bear the marks of the propagandist and proselytizer: exaggeration, simplification, and schematization. But his point is clear:

> Now, in the best of the ordinary types of management, the managers recognize frankly that the . . . workmen, included in the twenty or thirty trades, who are under them, possess this mass of traditional knowledge, a large part of which is not in the possession of management. The management, of course, includes foremen and superintendents, who themselves have been first-class workers at their trades. And yet these foremen and superintendents know, better than any one else, that their own knowledge and personal skill falls far short of the combined knowledge and dexterity of all the workmen under them. The most experienced managers frankly place before their workmen the problem of doing the work in the best and most economical way. They recognize the task before them as that of inducing each workman to use his best endeavors, his hardest work, all his traditional knowledge, his skill, his ingenuity, and his good-will—in a word, his "initiative," so as to yield the largest possible return to his employer.[18]

As we have already seen from Taylor's belief in the universal prevalence and in fact inevitability of "soldiering," he did not recommend reliance upon the "initiative" of workers. Such a course, he felt, leads to the surrender of control: "As was usual then, and in fact as is still usual in most of the shops in this country, the shop was really run by the workmen and not by the bosses. The workmen together had carefully planned just how fast each job should be done." In his Midvale battle, Taylor pointed out, he had located the

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particular situations until the scale of production is adequate to support the efforts and costs involved in "rationalizing" it. It is for this reason above all that Taylorism coincides with the growth of production and its concentration in ever larger corporate units in the latter part of the nineteenth and in the twentieth centuries.

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source of the trouble in the "ignorance of the management as to what really constitutes a proper day's work for a workman." He had "fully realized that, although he was foreman of the shop, the combined knowledge and skill of the workmen who were under him was certainly ten times as great as his own." [19] This, then, was the source of the trouble and the starting point of scientific management.

We may illustrate the Taylorian solution to this dilemma in the same manner that Taylor often did: by using his story of his work for the Bethlehem Steel Company in supervising the moving of pig iron by hand. This story has the advantage of being the most detailed and circumstantial he set down, and also of dealing with a type of work so simple that anyone can visualize it without special technical preparation. We extract it here from Taylor's *The Principles of Scientific Management*:

> One of the first pieces of work undertaken by us, when the writer started to introduce scientific management into the Bethlehem Steel Company, was to handle pig iron on task work. The opening of the Spanish War found some 80,000 tons of pig iron placed in small piles in an open field adjoining the works. Prices for pig iron had been so low that it could not be sold at a profit, and therefore had been stored. With the opening of the Spanish War the price of pig iron rose, and this large accumulation of iron was sold. This gave us a good opportunity to show the workmen, as well as the owners and managers of the works, on a fairly large scale the advantages of task work over the old-fashioned day work and piece work, in doing a very elementary class of work.
>
> The Bethlehem Steel Company had five blast furnaces, the product of which had been handled by a pig-iron gang for many years. This gang, at this time, consisted of about 75 men. They were good, average pig-iron handlers, were under an excellent foreman who himself had been a pig-iron handler, and the work was done, on the whole, about as fast and as cheaply as it was anywhere else at that time.
>
> A railroad switch was run out into the field, right along the edge of the piles of pig iron. An inclined plank was placed against the side of a car, and each man picked up from his pile

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a pig of iron weighing about 92 pounds, walked up the inclined plank and dropped it on the end of the car.

We found that this gang were loading on the average about 12½ long tons per man per day. We were surprised to find, after studying the matter, that a first-class pig-iron handler ought to handle between 47 and 48 long tons per day, instead of 12½ tons. This task seemed to us so very large that we were obliged to go over our work several times before we were absolutely sure that we were right. Once we were sure, however, that 47 tons was a proper day's work for a first-class pig-iron handler, the task which faced us as managers under the modern scientific plan was clearly before us. It was our duty to see that the 80,000 tons of pig iron was loaded on to the cars at the rate of 47 tons per man per day, in place of 12½ tons, at which rate the work was then being done. And it was further our duty to see that this work was done without bringing on a strike among the men, without any quarrel with the men, and to see that the men were happier and better contented when loading at the new rate of 47 tons than they were when loading at the old rate of 12½ tons.

Our first step was the scientific selection of the workman. In dealing with workmen under this type of management, it is an inflexible rule to talk to and deal with only one man at a time, since each workman has his own special abilities and limitations, and since we are not dealing with men in masses, but are trying to develop each individual man to his highest state of efficiency and prosperity. Our first step was to find the proper workman to begin with. We therefore carefully watched and studied these 75 men for three or four days, at the end of which time we had picked out four men who appeared to be physically able to handle pig iron at the rate of 47 tons per day. A careful study was then made of each of these men. We looked up their history as far back as practicable and thorough inquiries were made as to the character, habits, and the ambition of each of them. Finally we selected one from among the four as the most likely man to start with. He was a little Pennsylvania Dutchman who had been observed to trot back home for a mile or so after his work in the evening, about as fresh as he was when he came trotting down to work in the morning. We found that upon wages of $1.15 a day he had succeeded in buying a small plot of ground, and that he was engaged in putting up the walls

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of a little house for himself in the morning before starting to work and at night after leaving. He also had the reputation of being exceedingly "close," that is, of placing a very high value on a dollar. As one man whom we talked to about him said, "A penny looks about the size of a cart-wheel to him." This man we will call Schmidt.

The task before us, then, narrowed itself down to getting Schmidt to handle 47 tons of pig iron per day and making him glad to do it. This was done as follows. Schmidt was called out from among the gang of pig-iron handlers and talked to somewhat in this way:

"Schmidt, are you a high-priced man?"

"Vell, I don't know vat you mean."

"Oh yes, you do. What I want to know is whether you are a high-priced man or not."

"Vell, I don't know vat you mean."

"Oh, come now, you answer my questions. What I want to find out is whether you are a high-priced man or one of these cheap fellows here. What I want to find out is whether you want to earn $1.85 a day or whether you are satisfied with $1.15, just the same as all those cheap fellows are getting."

"Did I vant $1.85 a day? Vas dot a high-priced man? Vell, yes, I vas a high-priced man."

"Oh, you're aggravating me. Of course you want $1.85 a day—every one wants it! You know perfectly well that that has very little to do with your being a high-priced man. For goodness' sake answer my questions, and don't waste any more of my time. Now come over here. You see that pile of pig iron?"

"Yes."

"You see that car?"

"Yes."

"Well, if you are a high-priced man, you will load that pig iron on that car to-morrow for $1.85. Now do wake up and answer my question. Tell me whether you are a high-priced man or not."

"Vell—did I got $1.85 for loading dot pig iron on dot car to-morrow?"

"Yes, of course you do, and you get $1.85 for loading a pile like that every day right through the year. That is what a high-priced man does, and you know it just as well as I do."

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"Vell, dot's all right. I could load dot pig iron on the car to-morrow for $1.85, and I get it every day, don't I?"

"Certainly you do—certainly you do."

"Vell, den, I vas a high-priced man."

"Now, hold on, hold on. You know just as well as I do that a high-priced man has to do exactly as he's told from morning till night. You have seen this man here before, haven't you?"

"No, I never saw him."

"Well, if you are a high-priced man, you will do exactly as this man tells you to-morrow, from morning till night. When he tells you to pick up a pig and walk, you pick it up and you walk, and when he tells you to sit down and rest, you sit down. You do that right straight through the day. And what's more, no back talk. Now a high-priced man does just what he's told to do, and no back talk. Do you understand that? When this man tells you to walk, you walk; when he tells you to sit down, you sit down, and you don't talk back at him. Now you come on to work here to-morrow morning and I'll know before night whether you are really a high-priced man or not."

This seems to be rather rough talk. And indeed it would be if applied to an educated mechanic, or even an intelligent laborer. With a man of the mentally sluggish type of Schmidt it is appropriate and not unkind, since it is effective in fixing his attention on the high wages which he wants and away from what, if it were called to his attention, he probably would consider impossibly hard work. . . .

Schmidt started to work, and all day long, and at regular intervals, was told by the man who stood over him with a watch, "Now pick up a pig and walk. Now sit down and rest. Now walk—now rest," etc. He worked when he was told to work, and rested when he was told to rest; and at half-past five in the afternoon had his 47½ tons loaded on the car. And he practically never failed to work at this pace and do the task that was set him during the three years that the writer was at Bethlehem. And throughout this time he averaged a little more than $1.85 per day, whereas before he had never received over $1.15 per day, which was the ruling rate of wages at that time in Bethlehem. That is, he received 60 per cent. higher wages than were paid to other men who were not working on task work. One man after another was picked out and trained to handle

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> pig iron at the rate of 47½ tons per day until all of the pig iron was handled at this rate, and the men were receiving 60 per cent. more wages than other workmen around them.[20] *

The merit of this tale is its clarity in illustrating the pivot upon which all modern management turns: the control over work through the control over the *decisions that are made in the course of work.* Since, in the case of pig-iron handling, the only decisions to be made were those having to do with a time sequence, Taylor simply dictated that timing and the results at the end of the day added up to his planned day-task. As to the use of money as motivation, while this element has a usefulness in the first stages of a new mode of work, employers do not, when they have once found a way to compel a more rapid pace of work, continue to pay a 60 percent differential for common labor, or for any other job. Taylor was to discover (and to complain) that management treated his "scientific incentives" like any other piece rate, cutting them mercilessly

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* Daniel Bell has recorded this event as follows: "But it was in 1899 that Taylor achieved fame when he taught a Dutchman named Schmidt to shovel forty-seven tons instead of twelve and a half tons of pig iron a day. Every detail of the man's job was specified: the size of the shovel, the bite into the pile, the weight of the scoop, the distance to walk, the arc of the swing, and the rest periods that Schmidt should take. By systematically varying each factor, Taylor got the optimum amount of barrow load." [21] In the face of so much circumstantial detail, one hesitates to inquire whether Professor Bell can imagine handling a 92-pound pig of iron on a shovel, let alone what sort of an "arc of the swing" one could manage, or how a "barrow" would handle a whole "scoop" of them. The point here is not that anyone may be tripped up by the use of secondary sources, or get his stories mixed, or have never seen a pig of iron; the point is that sociologists, with few exceptions, deem it proper to write about occupations, work, skills, etc. without even bare familiarity. The result is what one would get from a school of literary critics who never read the novels, plays, poems they write about, but construct their theories entirely on the basis of responses to questionnaires put to "scientifically selected samples" of readers. Bell's error is only the grandfather of a long line of such misapprehensions, which become truly extraordinary as more complex forms of work are dealt with. In this situation, management can—and gleefully does—tell academics anything it pleases about the evolution of work, skills, etc.

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so long as the labor market permitted, so that workers pushed to the Taylorian intensity found themselves getting little, or nothing, more than the going rate for the area, while other employers—under pressure of this competitive threat—forced their own workers to the higher intensities of labor.*

Taylor liked to pretend that his work standards were not beyond human capabilities exercised without undue strain, but as he himself made clear, this pretense could be maintained only on the understanding that unusual physical specimens were selected for each of his jobs:

> As to the scientific selection of the men, it is a fact that in this gang of 75 pig-iron handlers only about one man in eight was physically capable of handling 47½ tons per day. With the very best of intentions, the other seven out of eight men were physically unable to work at this pace. Now the one man in eight who was able to do this work was in no sense superior to the other men who were working on the gang. He merely happened to be a man of the type of the ox,—no rare specimen of humanity, difficult to find and therefore very highly prized. On the contrary, he was a man so stupid that he was unfitted to do most kinds of laboring work, even. The selection of the man, then, does not involve finding some extraordinary individual, but merely picking out from among very ordinary men the few who are especially suited to this type of work. Although in this particular gang only one man in eight was suited to doing the work, we had not the slightest difficulty in getting all the men who were needed—some of them from inside the works and others from the neighboring country—who were exactly suited to the job.[23] **

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* In his classic study of scientific management undertaken in 1915 for the United States Commission on Industrial Relations, Robert F. Hoxie pointed out that most rate cutting in shops which had installed a formal system of scientific management took place indirectly, by creating new job classifications at lower rates, etc. He concludes that under scientific management "what amounts to rate cutting seems to be almost of necessity an essential part of its very nature." [22]

** Georges Friedmann reports that in 1927 a German physiologist, reviewing the Schmidt experience, calculated that the level of output set by

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Taylor spent his lifetime in expounding the principles of control enunciated here, and in applying them directly to many other tasks: shoveling loose materials, lumbering, inspecting ball bearings, etc., but particularly to the machinist's trade. He believed that the forms of control he advocated could be applied not only to simple labor, but to labor in its most complex forms, without exception, and in fact it was in machine shops, bricklaying, and other such sites for the practice of well-developed crafts that he and his immediate successors achieved their most striking results.

From earliest times to the Industrial Revolution the craft or skilled trade was the basic unit, the elementary cell of the labor process. In each craft, the worker was presumed to be the master of a body of traditional knowledge, and methods and procedures were left to his or her discretion. In each such worker reposed the accumulated knowledge of materials and processes by which production was accomplished in the craft. The potter, tanner, smith, weaver, carpenter, baker, miller, glassmaker, baker, etc., each representing a branch of the social division of labor, was a repository of human technique for the labor processes of that branch. The worker combined, in mind and body, the concepts and physical dexterities of the specialty: technique, understood in this way, is, as has often been observed, the predecessor and progenitor of science. The most important and widespread of all crafts was, and throughout the world remains to this day, that of farmer. The farming family combines its craft with the rude practice of a number of

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Taylor could not be accepted as a standard because "most workers will succumb under the pressure of these labors." [24] Yet Taylor persisted in calling it "a pace under which men become happier and thrive." [25] We should also note that although Taylor called Schmidt "a man of the type of the ox," and Schmidt's stupidity has become part of the folklore of industrial sociology, Taylor himself reported that Schmidt was building his own house, presumably without anyone to tell him when to stand and when to squat. But a belief in the original stupidity of the worker is a necessity for management; otherwise it would have to admit that it is engaged in a wholesale enterprise of prizing and fostering stupidity.

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others, including those of the smith, mason, carpenter, butcher, miller, and baker, etc. The apprenticeships required in traditional crafts ranged from three to seven years, and for the farmer of course extends beyond this to include most of childhood, adolescence, and young adulthood. In view of the knowledge to be assimilated, the dexterities to be gained, and the fact that the craftsman, like the professional, was required to master a specialty and become the best judge of the manner of its application to specific production problems, the years of apprenticeship were generally needed and were employed in a learning process that extended well into the journeyman decades. Of these trades, that of the machinist was in Taylor's day among the most recent, and certainly the most important to modern industry.

As I have already pointed out, Taylor was not primarily concerned with the advance of technology (which, as we shall see, offers other means for direct control over the labor process). He did make significant contributions to the technical knowledge of machine-shop practice (high-speed tool steel, in particular), but these were chiefly by-products of his effort to study this practice with an eye to systematizing and classifying it. His concern was with the control of labor at any given level of technology, and he tackled his own trade with a boldness and energy which astonished his contemporaries and set the pattern for industrial engineers, work designers, and office managers from that day on. And in tackling machine-shop work, he had set himself a prodigious task.

The machinist of Taylor's day started with the shop drawing, and turned, milled, bored, drilled, planed, shaped, ground, filed, and otherwise machine- and hand-processed the proper stock to the desired shape as specified in the drawing. The range of decisions to be made in the course of the process is—unlike the case of a simple job, such as the handling of pig iron—by its very nature enormous. Even for the lathe alone, disregarding all collateral tasks such as the choice of stock, handling, centering and chucking the work, layout and measuring, order of cuts, and considering only the operation of

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turning itself, the range of possibilities is huge. Taylor himself worked with twelve variables, including the hardness of the metal, the material of the cutting tool, the thickness of the shaving, the shape of the cutting tool, the use of a coolant during cutting, the depth of the cut, the frequency of regrinding cutting tools as they became dulled, the lip and clearance angles of the tool, the smoothness of cutting or absence of chatter, the diameter of the stock being turned, the pressure of the chip or shaving on the cutting surface of the tool, and the speeds, feeds, and pulling power of the machine.[26] Each of these variables is subject to broad choice, ranging from a few possibilities in the selection and use of a coolant, to a very great number of effective choices in all matters having to do with thickness, shape, depth, duration, speed, etc. Twelve variables, each subject to a large number of choices, will yield in their possible combinations and permutations astronomical figures, as Taylor soon realized. But upon these decisions of the machinist depended not just the accuracy and finish of the product, but also the pace of production. Nothing daunted, Taylor set out to gather into management's hands all the basic information bearing on these processes. He began a series of experiments at the Midvale Steel Company, in the fall of 1880, which lasted twenty-six years, recording the results of between 30,000 and 50,000 tests, and cutting up more than 800,000 pounds of iron and steel on ten different machine tools reserved for his experimental use.* His greatest difficulty, he reported, was not

* Friedmann so far forgets this enormous machine-shop project at one point that he says: "This failure to appreciate the psychological factors in work is at least partially explained by the nature of the jobs to which Taylor exclusively confined his observations: handlers of pig iron, shovel-laborers, and navvies." [27] He was led to this error by his marked tendency to side with the psychological and sociological schools of "human relations" and work adjustment which came after Taylor, and which he always attempts to counterpose to Taylorism, although, as we have pointed out, they operate on different levels. In general, Friedmann, with all his knowledge of work processes, suffers from a confusion of viewpoints, writing sometimes as a

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testing the many variations, but holding eleven variables constant while altering the conditions of the twelfth. The data were systematized, correlated, and reduced to practical form in the shape of what he called a "slide rule" which would determine the optimum combination of choices for each step in the machining process.[28] His machinists thenceforth were required to work in accordance with instructions derived from these experimental data, rather than from their own knowledge, experience, or tradition. This was the Taylor approach in its first systematic application to a complex labor process. Since the principles upon which it is based are fundamental to all advanced work design or industrial engineering today, it is important to examine them in detail. And since Taylor has been virtually alone in giving clear expression to principles which are seldom now publicly acknowledged, it is best to examine them with the aid of Taylor's own forthright formulations.

First Principle

"The managers assume . . . the burden of gathering together all of the traditional knowledge which in the past has been possessed by the workmen and then of classifying, tabulating, and reducing this knowledge to rules, laws, and formulae. . . ." [29] We have seen the illustrations of this in the cases of the lathe machinist and the pig-iron handler. The great disparity between these activities, and the different orders of knowledge that may be collected about them, illustrate that for Taylor—as for managers today—no task is either so simple or so complex that it may not be studied with the object of collecting in the hands of management at least as much information as is known by the worker who performs it

socialist concerned about the trends in capitalist work organization, but more often as though the various forms of capitalist management and personnel administration represent scrupulous efforts to find a universal answer to problems of work.

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regularly, and very likely more. This brings to an end the situation in which "Employers derive their knowledge of how much of a given class of work can be done in a day from either their own experience, which has frequently grown hazy with age, from casual and unsystematic observation of their men, or at best from records which are kept, showing the quickest time in which each job has been done." [30] It enables management to discover and enforce those speedier methods and shortcuts which workers themselves, in the practice of their trades or tasks, learn or improvise, and use at their own discretion only. Such an experimental approach also brings into being new methods such as can be devised only through the means of systematic study.

This first principle we may call the *dissociation of the labor process from the skills of the workers.* The labor process is to be rendered independent of craft, tradition, and the workers' knowledge. Henceforth it is to depend not at all upon the abilities of workers, but entirely upon the practices of management.

Second Principle

"All possible brain work should be removed from the shop and centered in the planning or laying-out department. . . ." [31] Since this is the key to scientific management, as Taylor well understood, he was especially emphatic on this point and it is important to examine the principle thoroughly.

In the human, as we have seen, the essential feature that makes for a labor capacity superior to that of the animal is the combination of execution with a conception of the thing to be done. But as human labor becomes a social rather than an individual phenomenon, it is possible—unlike in the instance of animals where the motive force, instinct, is inseparable from action—to divorce conception from execution. This dehumanization of the labor process, in which workers are reduced almost to the level of labor in its animal form, while purposeless and unthinkable in the case of the self-organized

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and self-motivated social labor of a community of producers, becomes crucial for the management of purchased labor. For if the workers' execution is guided by their own conception, it is not possible, as we have seen, to enforce upon them either the methodological efficiency or the working pace desired by capital. The capitalist therefore learns from the start to take advantage of this aspect of human labor power, and to break the unity of the labor process.

This should be called the principle of the *separation of conception from execution*, rather than by its more common name of the separation of mental and manual labor (even though it is similar to the latter, and in practice often identical). This is because mental labor, labor done primarily in the brain, is also subjected to the same principle of separation of conception from execution: mental labor is first separated from manual labor and, as we shall see, is then itself subdivided rigorously according to the same rule.

The first implication of this principle is that Taylor's "science of work" is never to be developed by the worker, always by management. This notion, apparently so "natural" and undebatable today, was in fact vigorously discussed in Taylor's day, a fact which shows how far we have traveled along the road of transforming all ideas about the labor process in less than a century, and how completely Taylor's hotly contested assumptions have entered into the conventional outlook within a short space of time. Taylor confronted this question—why must work be studied by the management and not by the worker himself; why not *scientific workmanship* rather than *scientific management*?—repeatedly, and employed all his ingenuity in devising answers to it, though not always with his customary frankness. In *The Principles of Scientific Management*, he pointed out that the "older system" of management

> makes it necessary for each workman to bear almost the entire responsibility for the general plan as well as for each detail of his work, and in many cases for his implements as well. In

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> addition to this he must do all of the actual physical labor. The development of a science, on the other hand, involves the establishment of many rules, laws, and formulae which replace the judgment of the individual workman and which can be effectively used only after having been systematically recorded, indexed, etc. The practical use of scientific data also calls for a room in which to keep the books, records, etc., and a desk for the planner to work at. Thus all of the planning which under the old system was done by the workman, as a result of his personal experience, must of necessity under the new system be done by the management in accordance with the laws of the science; because even if the workman was well suited to the development and use of scientific data, it would be physically impossible for him to work at his machine and at a desk at the same time. It is also clear that in most cases one type of man is needed to plan ahead and an entirely different type to execute the work.[32]

The objections having to do with physical arrangements in the workplace are clearly of little importance, and represent the deliberate exaggeration of obstacles which, while they may exist as inconveniences, are hardly insuperable. To refer to the "different type" of worker needed for each job is worse than disingenuous, since these "different types" hardly existed until the division of labor created them. As Taylor well understood, the possession of craft knowledge made the worker the best starting point for the development of the science of work; systematization often means, at least at the outset, the gathering of knowledge which *workers already possess.* But Taylor, secure in his obsession with the immense reasonableness of his proposed arrangement, did not stop at this point. In his testimony before the Special Committee of the House of Representatives, pressed and on the defensive, he brought forth still other arguments:

> I want to make it clear, Mr. Chairman, that work of this kind undertaken by the management leads to the development of a science, while it is next to impossible for the workman to develop a science. There are many workmen who are intellec-

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> tually just as capable of developing a science, who have plenty of brains, and are just as capable of developing a science as those on the managing side. But the science of doing work of any kind cannot be developed by the workman. Why? Because he has neither the time nor the money to do it. The development of the science of doing any kind of work always required the work of two men, one man who actually does the work which is to be studied and another man who observes closely the first man while he works and studies the time problems and the motion problems connected with this work. No workman has either the time or the money to burn in making experiments of this sort. If he is working for himself no one will pay him while he studies the motions of some one else. The management must and ought to pay for all such work. So that for the workman, the development of a science becomes impossible, not because the workman is not intellectually capable of developing it, but he has neither the time nor the money to do it and he realizes that this is a question for the management to handle.[33]

Taylor here argues that the systematic study of work and the fruits of this study belong to management for the very same reason that machines, factory buildings, etc., belong to them; that is, because it costs labor time to conduct such a study, and only the possessors of capital can afford labor time. The possessors of labor time cannot themselves afford to do anything with it but sell it for their means of subsistence. It is true that this is the rule in capitalist relations of production, and Taylor's use of the argument in this case shows with great clarity where the sway of capital leads: Not only is capital the property of the capitalist, but *labor itself has become part of capital.* Not only do the workers lose control over their instruments of production, but they must now lose control over their own labor and the manner of its performance. This control now falls to those who can "afford" to study it in order to know it better than the workers themselves know their own life activity.

But Taylor has not yet completed his argument: "Further-

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more," he told the Committee, "if any workman were to find a new and quicker way of doing work, or if he were to develop a new method, you can see at once it becomes to his interest to keep that development to himself, not to teach the other workmen the quicker method. It is to his interest to do what workmen have done in all times, to keep their trade secrets for themselves and their friends. That is the old idea of trade secrets. The workman kept his knowledge to himself instead of developing a science and teaching it to others and making it public property." [34] Behind this hearkening back to old ideas of "guild secrets" is Taylor's persistent and fundamental notion that the improvement of work methods by workers brings few benefits to management. Elsewhere in his testimony, in discussing the work of his associate, Frank Gilbreth, who spent many years studying bricklaying methods, he candidly admits that not only *could* the "science of bricklaying" be developed by workers, but that it undoubtedly *had been:* "Now, I have not the slightest doubt that during the last 4,000 years all the methods that Mr. Gilbreth developed have many, many times suggested themselves to the minds of bricklayers." But because knowledge possessed by workers is not useful to capital, Taylor begins his list of the desiderata of scientific management: "First. The development—by the management, not the workmen—of the science of bricklaying." [35] Workers, he explains, are not going to put into execution any system or any method which harms them and their workmates: "Would they be likely," he says, referring to the pig-iron job, "to get rid of seven men out of eight from their own gang and retain only the eighth man? No!" [36]

Finally, Taylor understood the Babbage principle better than anyone of his time, and it was always uppermost in his calculations. The purpose of work study was never, in his mind, to enhance the ability of the worker, to concentrate in the worker a greater share of scientific knowledge, to ensure that as technique rose, the worker would rise with it. Rather, the purpose was to cheapen the worker by decreasing his training and enlarging his output. In his early book, *Shop*

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Management, he said frankly that the "full possibilities" of his system "will not have been realized until almost all of the machines in the shop are run by men who are of smaller calibre and attainments, and who are therefore cheaper than those required under the old system." [37]

Therefore, both in order to ensure management control and to cheapen the worker, conception and execution must be rendered separate spheres of work, and for this purpose the study of work processes must be reserved to management and kept from the workers, to whom its results are communicated only in the form of simplified job tasks governed by simplified instructions which it is thenceforth their duty to follow unthinkingly and without comprehension of the underlying technical reasoning or data.

Third Principle

The essential idea of "the ordinary types of management," Taylor said, "is that each workman has become more skilled in his own trade than it is possible for any one in the management to be, and that, therefore, the details of how the work shall best be done must be left to him." But, by contrast: "Perhaps the most prominent single element in modern scientific management is the task idea. The work of every workman is fully planned out by the management at least one day in advance, and each man receives in most cases complete written instructions, describing in detail the task which he is to accomplish, as well as the means to be used in doing the work. . . . This task specifies not only what is to be done, but how it is to be done and the exact time allowed for doing it. . . . Scientific management consists very largely in preparing for and carrying out these tasks." [38]

In this principle it is not the written instruction card that is important.* Taylor had no need for such a card with Schmidt,

* This despite the fact that for a time written instruction cards were a fetish among managers. The vogue for such cards passed as work tasks

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nor did he use one in many other instances. Rather, the essential element is the systematic pre-planning and pre-calculation of all elements of the labor process, which now no longer exists as a process in the imagination of the worker but only as a process in the imagination of a special management staff. Thus, if the first principle is the gathering and development of knowledge of labor processes, and the second is the concentration of this knowledge as the exclusive province of management—together with its essential converse, the absence of such knowledge among the workers—then the third is the *use of this monopoly over knowledge to control each step of the labor process and its mode of execution.*

As capitalist industrial, office, and market practices developed in accordance with this principle, it eventually became part of accepted routine and custom, all the more so as the increasingly scientific character of most processes, which grew in complexity while the worker was not allowed to partake of this growth, made it ever more difficult for the workers to understand the processes in which they functioned. But in the beginning, as Taylor well understood, an abrupt psychological wrench was required.* We have seen in the simple Schmidt

became so simplified and repetitious as to render the cards in most cases unnecessary. But the concept behind them remains: it is the concept of the direct action of management to determine the process, with the worker functioning as the mediating and closely governed instrument. This is the significance of Lillian Gilbreth's definition of the instruction card as "a self-producer of a predetermined product." [39] The worker as producer is ignored; management becomes the producer, and its plans and instructions bring the product into existence. This same instruction card inspired in Alfred Marshall, however, the curious opinion that from it, workers could learn how production is carried on: such a card, "whenever it comes into the hands of a thoughtful man, may suggest to him something of the purposes and methods of those who have constructed it." [40] The worker, in Marshall's notion, having given up technical knowledge of the craft, is now to pick up the far more complex technical knowledge of modern industry from his task card, as a paleontologist reconstructs the entire animal from a fragment of a bone!

* One must not suppose from this that such a psychological shift in relations between worker and manager is entirely a thing of the past. On the

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case the means employed, both in the selection of a single worker as a starting point and in the way in which he was reoriented to the new conditions of work. In the more complex conditions of the machine shop, Taylor gave this part of the responsibility to the foremen. It is essential, he said of the gang bosses, to "nerve and brace them up to the point of insisting that the workmen shall carry out the orders exactly as specified on the instruction cards. This is a difficult task at first, as the workmen have been accustomed for years to do the details of the work to suit themselves, and many of them are intimate friends of the bosses and believe they know quite as much about their business as the latter." [41]

Modern management came into being on the basis of these principles. It arose as theoretical construct and as systematic practice, moreover, in the very period during which the transformation of labor from processes based on skill to processes based upon science was attaining its most rapid tempo. Its role was to render conscious and systematic, the formerly unconscious tendency of capitalist production. It was to ensure that as craft declined, the worker would sink to the level of general and undifferentiated labor power, adaptable to a large range of simple tasks, while as science grew, it would be concentrated in the hands of management.

contrary, it is constantly being recapitulated in the evolution of new occupations as they are brought into being by the development of industry and trade, and are then routinized and subjugated to management control. As this tendency has attacked office, technical, and "educated" occupations, sociologists have spoken of it as "bureaucratization," an evasive and unfortunate use of Weberian terminology, a terminology which often reflects its users' view that this form of government over work is endemic to "large-scale" or "complex" enterprises, whereas it is better understood as the specific product of the capitalist organization of work, and reflects not primarily scale but social antagonisms.

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Notes

1. Peter F. Drucker, "Work and Tools," in Melvin Kranzberg and William H. Davenport, eds., *Technology and Culture* (New York, 1972), pp. 192–93.
2. George Soule, *Economic Forces in American History* (New York, 1952), p. 241.
3. Peter F. Drucker, *The Practice of Management* (New York, 1954), p. 280.
4. See Sudhir Kakar, *Frederick Taylor: A Study in Personality and Innovation* (Cambridge, Mass., 1970), pp. 115–17; and Henri Fayol, *General and Industrial Management* (1916; trans., London, 1949).
5. Lyndall Urwick and E. F. L. Brech, *The Making of Scientific Management*, 3 vols. (London, 1945, 1946, 1948), vol. I, p. 17.
6. See Georges Friedmann, *Industrial Society* (Glencoe, Ill., 1964), esp. pp. 51–65.
7. Lyndall Urwick, *The Meaning of Rationalisation* (London, 1929), pp. 13–16.
8. Kakar, *Frederick Taylor*, pp. 17–27, 52–54.
9. Ibid., p. 61.
10. *Taylor's Testimony before the Special House Committee*, in Frederick W. Taylor, *Scientific Management* (New York and London, 1947), pp. 79–85; this is a single-volume edition of Taylor's three chief works, *Shop Management* (1903); *Principles of Scientific Management* (1911); and a public document, *Hearings Before Special Committee of the House of Representatives to Investigate the Taylor and Other Systems of Shop Management* (1912), which is given the above title in this volume. Each of the three book-length documents in this volume is paged separately.
11. Frederick W. Taylor, *Shop Management*, in *Scientific Management*, p. 30. See also Taylor's *The Principles of Scientific Management* (New York, 1967), pp. 13–14; and *Taylor's Testimony* in *Scientific Management*, p. 8.
12. *Shop Management*, pp. 32–33.
13. Ibid., pp. 34–35.
14. *The Principles of Scientific Management*, p. 52.
15. Elton Mayo, *The Social Problems of an Industrial Civilization* (Boston, 1945), p. 42.
16. William M. Leiserson, "The Economics of Restriction of Output"; quoted in Loren Baritz, *The Servants of Power* (New York, 1965), p. 100.

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17. William F. Whyte, *Men at Work* (Homewood, Ill., 1961), pp. 98–121; see also Whyte's *Money and Motivation* (New York, 1955), pp. 39–49.
18. *The Principles of Scientific Management*, p. 32.
19. Ibid., pp. 48–49, 53.
20. Ibid., pp. 41–47.
21. Daniel Bell, *Work and Its Discontents*, in *The End of Ideology* (Glencoe, Ill., 1960), p. 227.
22. Robert F. Hoxie, *Scientific Management and Labor* (New York and London, 1918), pp. 85–87.
23. *The Principles of Scientific Management*, pp. 61–62.
24. Friedmann, *Industrial Society*, p. 55.
25. *Shop Management*, p. 25.
26. *The Principles of Scientific Management*, pp. 107–109.
27. Friedmann, *Industrial Society*, p. 63.
28. *The Principles of Scientific Management*, p. 111.
29. Ibid., p. 36.
30. Ibid., p. 22.
31. *Shop Management*, pp. 98–99.
32. *The Principles of Scientific Management*, pp. 37–38.
33. *Taylor's Testimony before the House Special Committee*, pp. 235–236.
34. Loc. cit.
35. Ibid., pp. 75, 77.
36. *The Principles of Scientific Management*, p. 62.
37. *Shop Management*, p. 105.
38. *The Principles of Scientific Management*, pp. 63, 39.
39. Lillian Gilbreth, *The Psychology of Management* (1914), in *The Writings of the Gilbreths*, William R. Spriegel and Clark E. Myers, eds. (Homewood, Ill., 1953), p. 404.
40. Alfred Marshall, *Industry and Trade* (London, 1919, 1932), pp. 391–393.
41. *Shop Management*, p. 108.

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Clerical Workers

If we view the evolution of those occupations called "clerical" over a long time span, from the Industrial Revolution to the present, we are soon led to doubt that we are dealing with the continuous evolution of a single stratum. The clerical employees of the early nineteenth-century enterprise may, on the whole, more properly appear as the ancestors of modern professional management than of the present classification of clerical workers. While it is probable that some of the clerks of that time corresponded roughly to the modern clerical worker in function and status, it is for various reasons more accurate to see the clerical workers of the present monopoly capitalist era as virtually a new stratum, created in the last decades of the nineteenth century and tremendously enlarged since then.

The place of the handful of clerks in the early industrial enterprise—and there were generally fewer than a half-dozen in even the largest firms—was semi-managerial in terms of the present distribution of functions. Lockwood says of the mid-nineteenth century in his book on British clerical labor that "many of the clerks mentioned at the earlier period were probably performing duties which would nowadays be classified as 'managerial.' "[1] And, in fact, during the eighteenth century, "clerk" or "chief clerk" was the usual title of the manager in some British industries, on railways, and in public services. It was not uncommon for clerks to be paid by the manager out of his own salary, thus attesting to their position as assistant managers or at least assistants to the manager, and some would be favored with annuities upon the closing of a works or inheritances upon the death of the owner (Matthew Boulton, the pioneer machine builder, included such a

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provision in his will). Managers and owners filled clerical posts with their relatives, since clerks often rose into managerships or partnerships.[2] Klingender, writing of the period 1840 to 1860 in Britain, says: "As long as the requirements of banking, commerce, or industry did not exceed the resources of family concerns or small partnerships, there could not be an extensive development of clerical labour. In this early stage there was an almost feudal relationship between the small number of clerks to be found in such offices and their employers. The clerk was more a family servant than a wage labourer." [3] Lewis Corey, writing about the United States, says: "The clerk was an honored employee 150 years ago, and still more so in earlier times. His position was a confidential one, the employer discussed affairs with him and relied on his judgment; he might, and often did, become a partner and marry the employer's daughter. The clerk was measurably a professional and undeniably a member of the middle class." [4]

This picture of the clerk as assistant manager, retainer, confidant, management trainee, and prospective son-in-law can of course be overdrawn. There were clerks—hard-driven copyists in law offices, for example—whose condition and prospects in life were little better than those of dock workers. But by and large, in terms of function, authority, pay, tenure of employment (a clerical position was usually a lifetime post), prospects, not to mention status and even dress, the clerks stood much closer to the employer than to factory labor.

This is underlined by the tiny size of the nineteenth-century clerical groups. The census of 1870 in the United States classified only 82,000—or six-tenths of 1 percent of all "gainful workers"—in clerical occupations.* In Great Britain, the

* Occupational statistics more than a half-century old must be viewed with skepticism, since the methods of counting and of classification, apart from their crudity, were often not comparable to those used at present. They must be taken as estimates rather than precise statistics (even modern statistics fall far short of precision, especially when they involve counts and classifications of the low-wage strata). In the present discussion they are used as indicators of relative orders of magnitude, and they are adequate for that purpose.

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census of 1851 counted some 70,000 to 80,000 clerks, or eight-tenths of 1 percent of the gainfully occupied. By the turn of the century the proportion of clerks in the working population had risen to 4 percent in Great Britain and 3 percent in the United States; in the intervening decades, the clerical working class had begun to be born. By the census of 1961, there were in Britain about 3 million clerks, almost 13 percent of the occupied population; and in the United States in 1970, the clerical classification had risen to more than 14 million workers, almost 18 percent of the gainfully occupied, making this equal in size, among the gross classifications of the occupational scale, to that of operatives of all sorts.

It must be emphasized, for the sake of avoiding confusion with the common but absolutely meaningless term "white-collar worker," that the clerical classification to which these figures refer and which is discussed in this section includes only such occupations as bookkeeper (generally speaking the highest occupation in this group), secretary, stenographer, cashier, bank teller, file clerk, telephone operator, office machine operator, payroll and timekeeping clerk, postal clerk, receptionist, stock clerk, typist, and the like—and it includes these clerical workers no matter where they are employed, in private or in government offices, in manufacturing, trade, banking, insurance, etc.

The creation of a new class of workers, having little continuity with the small and privileged clerical stratum of the past, is emphasized by fundamental changes in two other respects: composition by sex, and relative pay.

The British census of 1851 counted 19 women under the heading of "commercial clerks," and altogether it is estimated that no more than one-tenth of 1 percent of clerks were women—in other words, fewer than 100 of all clerks in the British Isles. In the United States as late as 1900, the clerical classification of under 900,000 persons was still more than three-quarters male. By the censuses of 1961 in Great Britain and 1960 in the United States, the percentage of women had risen in both countries to about two-thirds. And within only

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another decade in the United States, three-fourths were women: this represented an increase from a little over 200,000 female clerical workers in 1900 to more than 10 million only seventy years later! Male clerical workers, a rapidly declining proportion, were increasingly confined to occupations such as postal clerks and mail carriers, stock clerks and storekeepers, and shipping and receiving clerks.[5]

If we consider the pay scales for clerical labor as compared with the pay of production labor, the change is just as emphatic. According to Lockwood, the *lower* grades of British clerks in the period 1850 to 1880 were in the per annum range of £75 to £150. Only some 10 to 15 percent of the working class of the time was in that same range, the portion which Lockwood calls a "highly select superaristocracy."[6] We may conclude from this that the pay of clerks began at about the point where the pay of production and transportation workers left off. In the United States, in 1900, clerical employees of steam railroads and in manufacturing establishments had average annual earnings of $1,011; in the same year, the average annual earnings of workers in these industries was $435 for manufacturing and $548 for steam railroads.[7] And there are other indications that the average pay of the clerical classification was about double the production and transportation workers' average; in 1899, for example, the average pay of all full-time postal employees was $955.[8]

The extent of the change in relative pay scales that has taken place since that time is made clear in a Special Labor Force Report on weekly earnings of full-time workers in the United States, which groups workers by occupation and which was based upon data gathered by the Bureau of Labor Statistics in May 1971.[9] According to this report, the median usual weekly wage for full-time clerical work *was lower than that in every type of so-called blue-collar work.* In fact, it was lower than the median in all urban occupational classifications except service employment as the first table on the next page shows.

Nor does the fact that these medians are a form of averaging distort the picture of relative pay. In fact, the earnings

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Occupational group	*Median usual weekly earnings of full-time workers*
Craftsmen and foremen	$167
Operatives and kindred workers	120
Nonfarm laborers	117
Clerical workers	**115**
Service workers (except private household)	96

	Percent Distribution by Earnings				
	Under $60	*$60–$99*	*$100–$149*	*$150–$199*	*$200 or more*
Craftsmen and foremen	1.3	8.6	29.3	31.6	29.2
Operatives and kindred workers	4.2	29.0	36.5	20.8	9.4
Nonfarm laborers	6.9	28.6	38.3	18.6	7.6
Clerical workers	**5.2**	**29.8**	**42.2**	**16.4**	**6.3**
Service workers (except private household)	16.4	35.9	28.2	12.4	7.2

distribution simply bears out the impression conveyed by the medians, as can be seen in the second table above. From this tabulation it is clear how similar the pay scales and distributions are in the clerical and operative categories, the differences between the two—both in overall medians and in distribution—favoring the operatives.*

* In Great Britain the trend has been similar. Writing in 1958 and basing himself upon data up to 1956, Lockwood says: ". . . the gross change in income relativities is unmistakable. The main result of this change is that the average clerk is now very roughly on the same income level as the average manual worker, or perhaps even slightly below." [10] And the same conclusion was reached by David M. Gordon on the basis of 1959 data for the United States: "The full distributions of clerical and sales jobs and

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Clerical work in its earlier stages has been likened to a craft.[12] The similarities are indeed apparent. Although the tools of the craft consisted only of pen, ink, other desk appurtenances, and writing paper, envelopes, and ledgers, it represented a total occupation, the object of which was to keep current the records of the financial and operating condition of the enterprise, as well as its relations with the external world. Master craftsmen, such as bookkeepers or chief clerks, maintained control over the process in its totality, and apprentices or journeymen craftsmen—ordinary clerks, copying clerks, office boys—learned their crafts in office apprenticeships, and in the ordinary course of events advanced through the levels by promotion. The work involved, in addition to ordinary bookkeeping on the double-entry or Italian model (to which was added the rudiments of cost- as well as profit-and-loss accounting at the beginning of the nineteenth century), such tasks as timekeeping and payroll, quality control, commercial traveling, drafting, copying duplicates by hand, preparing accounts in several copies, etc.

In its most general aspects, office work entails accounting and recordkeeping, planning and scheduling, correspondence and interviewing, filing and copying, and the like. But with the development of the modern corporation these functions assume the particular forms of the various departments and branches of the enterprise.

The factory office, which began with its first and original functionary, the timekeeper, usually added as its second functionary a foreman's clerk, whose task was to assist the foreman by keeping track of the work in process and its stages of completion. These clerks had as their responsibility the records of workers, materials, and tasks. Out of these rudimentary functions grew the modern cost, planning and scheduling, purchasing, and engineering and design sections.

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blue-collar manual jobs were almost exactly comparable," so far as earnings are concerned.[11] But within only a decade, the rapidly worsening relative pay position of clerical workers brought them, on the average, *below* all forms of so-called blue-collar jobs.

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Sales, previously handled chiefly by the owner himself, perhaps assisted by a clerk who doubled as traveler, became the function of a marketing division, subdivided into sections to handle sales traveling, correspondence with customers, salesmen, and manufacturers, order processing, commissions, sales analyses, advertising, promotion, and publicity. A separate financial office takes care of financial statements, borrowing, extending credit, ensuring collections, assessing and regulating cash flow, etc. And so on for other office divisions, among which the most important is an administration office in which corporate policy is made and enforced upon all divisions.

The offices so described are those of a producing corporation, in which commodities in the form of goods or services are made and sold; these offices are thus subsidiary and complementary to the productive labor processes carried on elsewhere within the same corporation. But with the development of monopoly capitalism came the extraordinary enlargement of those types of enterprises which, entirely separated from the process of production, carry on their activities either chiefly or entirely through clerical labor.

Commercial concerns which deal only with the purchase and resale of commodities generally require three types of labor in large masses: distributive (for warehousing, packing, shipping), sales, and clerical. This is particularly true on the wholesale level, in which the clerks are the largest category of workers, outnumbering even sales workers. But even in retail trade, some kinds of enterprises, such as general merchandising and mail order houses, show a very large percentage of clerical labor.

In the pure *clerical industries,* this tendency is carried much further. Banks and credit agencies conduct only one mode of labor, the clerical, and below the managerial level the labor employed consists almost entirely of clerks who work in offices and service workers who clean the offices. The only thing that prevents this from being the case with brokerage and investment houses and insurance companies is the need for a large

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number of salespeople. To a lesser degree, the same heavily clerical character of the labor process is true of law offices and the offices of other institutionalized professions, advertising agencies, the publishers of books and periodicals insofar as they do not themselves do the work of manufacture, philanthropic and religious organizations, correspondence schools, agencies for travel, employment, etc., and government offices for public administration.

In all these industries, the development of capital has transformed the operating function of the capitalist from a personal activity into the work of a mass of people. The function of the capitalist is to represent capital and to enlarge it. This is done either by controlling the production of surplus value in the productive industries and activities, or by appropriating it from outside those industries and activities. The industrial capitalist, the manufacturer, is an example of the first; the banker of the second.* These management functions of control and appropriation have in themselves become labor processes. They are conducted by capital in the same way that it carries on the labor processes of production: with wage labor purchased on a large scale in a labor market and organized into huge "production" machines according to the same principles that govern the organization of factory labor. Here the productive processes of society disappear into a stream of paper—a stream of paper, moreover, which is

* The fact that banking corporations produce nothing, but merely profit from the mass of capital in money form at their disposal through activities which once went by the name "usury," no longer subjects them to discredit in monopoly capitalist society as it once did in feudal and in early capitalist society. In fact, financial institutions are accorded a place at the pinnacle of the social division of labor. This is because they have mastered the art of expanding capital without the necessity of passing it through any production process whatsoever. (The magical appearance of the feat merely conceals the fact that such corporations are appropriating a share in the values produced elsewhere.) The cleanliness and economy of the procedure, its absolute purity as a form of the accumulation of capital, now elicit nothing but admiration from those who are still tied to production.

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processed in a continuous flow like that of the cannery, the meatpacking line, the car assembly conveyor, by workers organized in much the same way.

This ghostly form of the production process assumes an ever greater importance in capitalist society, not only because of the requirements of the new way in which production is organized, and not only because of the growing need for coordination and control, but for another and more significant reason as well. In the social forms of capitalism all products of labor carry, apart from their physical characteristics, the invisible marks of *ownership.* Apart from their physical form, there is their social form as *value.* From the point of view of capital, the representation of value is more important than the physical form or useful properties of the labor product. The particular kind of commodity being sold means little; the net gain is everything. A portion of the labor of society must therefore be devoted to the accounting of value. As capitalism becomes more complex and develops into its monopoly stage, the accounting of value becomes infinitely more complex. The number of intermediaries between production and consumption increases, so that the value accounting of the single commodity is duplicated through a number of stages. The battle to realize values, to turn them into cash, calls for a special accounting of its own. Just as in some industries the labor expended upon marketing begins to approach the amount expended upon the production of the commodities being sold, so in some industries the labor expended upon the mere transformation of the form of value (from the commodity form into the form of money or credit)—including the policing, the cashiers and collection work, the recordkeeping, the accounting, etc.—begins to approach or surpass the labor used in producing the underlying commodity or service. And finally, as we have already noted, entire "industries" come into existence whose activity is concerned with nothing but the transfer of values and the accounting entailed by this.

Since the work of recording the movement of values is generally accomplished by a capitalist agency for its particular

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ends, its own accounting has no standing with other organizations. This leads to an immense amount of duplication. The normal presumption in intercorporate dealings is not one of honesty but of dishonesty; unverified records are not considered adequate or trustworthy for any purposes but those of the institution which keeps them. Thus each pair of corporations, in their dealings with each other in the transactions of purchase and sale, credit and payment, etc., maintain a complete set of records, each the mirror image of those kept by the other. That which appears on the books of one as a credit shows in the books of the other as a debit. Since, when disputes arise, the burden of proof is shuffled back and forth between the parties in accordance with the available documentation, *each set of records is as a rule a private affair to be used not for* helpful coordination but as a weapon.

The internal recordkeeping of each corporate institution is, moreover, constructed in a way which assumes the possible dishonesty, disloyalty, or laxity of every human agency which it employs; this, in fact, is the first principle of modern accounting. It is for this reason, among others, that double-entry bookkeeping proved so suitable to capitalist accounting. Under this system, every transaction is recorded at birth in two places, and the entire movement of the values that pass through the enterprise is reflected in an interlocking set of accounts which check and verify each other. The falsification of only one single account will usually lead directly to the falsifier, and as a rule the work of falsifying many accounts so that they continue in balance with each other is possible only through the collaboration of a number of people. This system of dovetailing accounts is supplemented by a variety of independent checks and controls. In total, a modern financial system, although not impervious to falsification or error, is a well-guarded structure a large part of which exists for purposes of self-security, and as a rule such falsifications as are found in it appear not by accident but by the policy of the management.

Nor is this all. Since corporations must exhibit financial

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statements to the outside world for the purpose of raising capital, and since various other needs for such public disclosure exist—such as bank credit, settlement of accounts with outside parties as required under contract with them, etc.—still another means of establishing the truth of records is provided. This is the independent audit by an accounting firm which makes it a "profession" to investigate records either when called upon or on a continuing basis, and to "certify" their results. The dishonesty presumed of all corporations is offset by the special function of such auditors, who are supposed to *make a profession of honesty,* although this is not usually the case either. At any rate, this brings into existence still another set of records and another species of duplicatory clerical work. And to this may be added much of the work of government regulatory and tax offices which deal with the same material from still other standpoints.

Thus the value-form of commodities separates itself out from the physical form as a vast paper empire which under capitalism becomes as real as the physical world, and which swallows ever increasing amounts of labor. This is the world in which value is kept track of, and in which surplus value is transferred, struggled over, and allocated. A society which is based upon the value-form surrenders more and more of its working population to the complex ramifications of the claims to ownership of value. Although there is no way of calculating it or testing the proposition, it is likely that the greatest part of the rapid increase of clerical labor is due to this; certainly there is no doubt that the demands of marketing, together with the demands of value accounting, consume the bulk of clerical time.

With the rapid growth of offices in the last decades of the nineteenth century, and the change of office work from something merely incidental to management into a labor process in its own right, the need to systematize and control it began to be felt. When this work was carried on in offices which contained only a few desks separated by a railing from

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the proprietor, it was, in effect, self-supervising, and required only the usual prudent safeguards against embezzlement, etc. In industrial enterprises, clerical expenses were small and incidental to production expenses. In commercial and financial offices, these expenses were also small and incidental before the era of mass merchandising, "consumer" banking, and group insurance. None of these enterprises could yet feel that its success was significantly dependent upon the efficiency of the clerical labor process.

As this situation changed, the intimate associations, the atmosphere of mutual obligation, and the degree of loyalty which characterized the small office became transformed from a prime desideratum into a positive liability, and management began to cut those ties and substitute the impersonal discipline of a so-called modern organization. To be sure, in doing so it was careful throughout this transitional period to retain as long as it could the feelings of obligation and loyalty it had traditionally fostered; but its own special commitments to its office staff were severed, one by one, as the office grew. The characteristic feature of this era was the ending of the reign of the bookkeeper and the rise of the office manager as the prime functionary and representative of higher management. Office managership, a product of the monopoly period of capitalism, developed as a specialized branch of management, with its own schools, professional associations, textbooks and manuals, periodicals, standards, and methods.

In the context of the times in which it took place, this naturally meant the application of scientific management methods to the office. By the first decades of the present century, the effort was well under way. In 1917, a volume entitled *Scientific Office Management,* and subtitled *A report on the results of applications of the Taylor System of Scientific Management to offices, supplemented with a discussion of how to obtain the most important of these results,* was published in New York, Chicago, and London. Its author, William Henry Leffingwell, had begun to use the Taylor system ten years earlier, and had accumulated considerable experience in offices like those of

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the Curtis Publishing Company. The following year Lee Galloway, for many years professor at New York University, published his standard work, *Office Management: Its Principles and Practice.* In these volumes, among others, the program of office management is clearly set forth: the purpose of the office is control over the enterprise, and the purpose of office management is control over the office. Thus Galloway:

> The larger . . . business offices grow, the more difficult and important become the problems of management. Orders must be given to employees by the managers, and reports of work performed must be recorded. Inspectors, superintendents, foremen, senior clerks, and office managers increase in number—their function being to keep the employees and machines working harmoniously. At first one of these supervisors can give instructions verbally and keep the details in his memory, but as the subdivisions of work increase the necessity grows for continual communication between the various ranks of authority. Letters and memos, production orders and work tickets, speaking tubes and telautographs, cost statistics and controlling accounts, time clocks and messenger boys, multiply to keep pace with the growing complexity of business and to save the time of executives and workmen alike.[13]

The emphasis in this passage is upon the increase in clerical work in the processes of production. But Galloway soon extends the idea to cover the total office function in the capitalist enterprise:

> Execution implies *control*—control of the factory organization—control of the financial organization—control of the marketing organization. It is the work of the office organization, under the supervision of the office manager, to devise records, methods, and systems for carrying out the function of control and for co-ordinating the activities of one department with those of another.[14]

With the growth of the control function, and with the consequent transformation of these functions of management into independent labor processes, comes the need to control

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the new labor processes, according to the same principles as those applied to the factory. Leffingwell thus says at the opening of his work:

> Time and motion study reveal just as startling results in the ordinary details of clerical work as they do in the factory. And after all, since every motion of the hand or body, every thought, no matter how simple, involves the consumption of physical energy, why should not the study and analysis of these motions result in the discovery of a mass of useless effort in clerical work just as it does in the factory?[15]

These early practitioners of scientific management applied to the office the basic concepts of the Taylor system, beginning with the breakup of the arrangement under which each clerk did his or her own work according to traditional methods, independent judgment, and light general supervision, usually on the part of the bookkeeper. Work was henceforth to be carried on as prescribed by the office manager, and its methods and time durations were to be verified and controlled by management on the basis of its own studies of each job. Thus Leffingwell instances the installation of the Taylor system in the offices of the Curtis Publishing Company, which conducted a large mail order operation. The opening of mail was reorganized, with the result that five hundred pieces per hour were handled by one clerk, as against the previous one hundred; the same efforts were applied to the standardization of over five hundred other clerical operations.

Stenographic output and other forms of typing were studied most carefully. "Some typewriter concerns equip their machines with a mechanical contrivance which automatically counts the strokes made on the typewriter and records them on a dial." This meter was used in conjunction with a time clock, which the typist punched at the start and finish of each job. Metering of this kind was used as the basis for piecework payments (it took some time before management experts discovered that under such a regimen typists never used the tabulator key, always the space bar, in order to increase their

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count). Companies using typewriters without such advanced equipment made use of the square-inch method described in many textbooks down to the present day. A celluloid sheet ruled in square inches is placed over the typed page, and the number of characters within the area of type is shown at the end of the last line. "If the letter is double-spaced," Galloway adds with the meticulous scientific spirit that characterizes his school, "the number of square inches is of course divided by two." The same result is obtained with a line gauge which measures length and number of lines. But these devices are merely preliminaries to the elaborate systems for recording output, typist by typist, by day and by week, so that the number of lines transcribed from dictation, copied from other documents, etc., is subject to continuous check.[16] Dictation time is also recorded, at first by the page and later, with the spread of dictation machines, by mechanical means. The object is a report which accounts for the time of every stenographer. The entire charting system resembles a factory production record, and is used in the same way for setting minimum standards and raising average standards of production.

As in the case of the factory, the system of production records is in itself a way of increasing output, apart from any changes in office methods. "As a means of knowing the capacity of every clerk," wrote Leffingwell, "and also as a means of spurring him to even better efforts, the planning department keeps daily records of the amount of work performed by each clerk and his relative efficiency. The keeping of such records alone has been known to greatly increase the efficiency of many offices." A great many of the effects obtained by scientific management came from this alone, despite the pretense that the studies were being conducted for purposes of methods improvement. When Leffingwell says, for example, that "the output of one clerk was doubled merely by the re-arrangement of the work on the desk," we may understand this was an effect of close and frightening supervision rather than a miracle of efficiency; this

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was understood by the managers as well, although concealed beneath a "scientific" mystique.[17]

From the beginning, office managers held that all forms of clerical work, not just routine or repetitive ones, could be standardized and "rationalized." For this purpose they undertook elaborate studies of even those occupations which involved little routine, scores of different operations each day, and the exercise of judgment. The essential feature of this effort was to make the clerical worker, of whatever sort, account for the entire working day. Its effect was to make the work of every office employee, no matter how experienced, the subject of management interference. In this way, management began to assert in the office its hitherto unused or sporadically exercised right of control over the labor process.

The introduction of piecework systems in their various forms—straight piece rates, incentives, or the Taylor differential system—followed naturally on the heels of the other innovations. "One of the great changes which forced business men to revise their opinions about the wages system was the enormous growth of the operating side of business. It became necessary to employ hundreds of clerks, typists, and bookkeepers instead of a half-dozen or so. The management was confronted with a new condition in which it was impossible to determine whether or not the employees were living up to the standard of a fair day's work." [18]

The early "scientific" office managers were primarily concerned with the theory of existing procedures rather than with the mechanization of the office; like Taylor, they took the existing level of technical development as given. Although the basic instrument of office labor, the typewriter, was in universal use, and the instruments for adding, dictating, and ledger posting by mechanical means had already been devised, the mechanization of the office still lay far in the future. Insofar as office managers dealt with the tools and materials of office labor, they concerned themselves chiefly with the trivia of arranging, and selecting among, existing possibilities. Office layout was given an inordinate amount of attention, and the

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use of pneumatic tubes for communication between desks and offices, and of endless conveyor belts for the movement of work in process, became quite fashionable. The economies sought in the organization of masses of labor can be seen, to take a single instance, from the following: Leffingwell calculated that the placement of water fountains so that each clerk walked, on the average, a mere hundred feet for a drink would cause the clerical workers in one office to walk an aggregate of fifty thousand miles each year just to drink an adequate amount of water, with a corresponding loss of time for the employer. (This represents the walking time of a thousand clerks, each of whom walked only a few hundred yards a day.) The care with which arrangements are made to avoid this "waste" gives birth to the sedentary tradition which shackles the clerical worker as the factory worker is shackled—by placing everything within easy reach so that the clerk not only need not, but dare not, be too long away from the desk.*

"If the paper upon which the writing is done is of good hard quality and a fine pen is used instead of a stub pen, the use of a blotter, and the thousands of useless motions caused by it, may be dispensed with. It is a saving far exceeding the pen supply for years. The size and shape of the penholder should also be carefully studied and standardized." One manager made a "time study" of the evaporation of inks and found that nonevaporating inkwells would save a dollar a year on each

* "Save ten steps a day for each of 12,000 employees," said Henry Ford of his system of having stock-chasers bring materials to the worker instead of having the worker move around freely, "and you will have saved fifty miles of wasted motion and misspent energy." [19] All motions or energies not directed to the increase of capital are of course "wasted" or "misspent." That every individual needs a variety of movements and changes of routine in order to maintain a state of physical health and mental freshness, and that from this point of view such motion is *not* wasted, does not enter into the case. The solicitude that brings everything to the worker's hand is of a piece with the fattening arrangements of a cattle feed-lot or poultry plant, in that the end sought is the same in each case: the fattening of the corporate balance sheet. The accompanying degenerative effects on the physique and well-being of the worker are not counted at all.

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inkwell. This is reported in all seriousness, along with the observation that the "rate of evaporation, of course, varies with the humidity, and the results would not be constant." A time study of the removal of pins or paper clips from correspondence before filing or destroying "showed that it required ten minutes to remove one pound of clips and pins. . . . It is true that the pins have to be put in the pin cushion, but this work can be done by the office messenger between trips. A thousand pins can be put in a pin cushion," Leffingwell adds, with uncharacteristic inexactitude, "in fifteen to twenty minutes." He concludes this discussion on a hortatory note:

> This brief outline of how the physical office may be standardized will give you an idea of the amount of detail to be considered. Under scientific management, however, the work of standardization is never quite complete. New and improved methods are constantly being evolved and tried out in order to keep up to date. The standards of today may be entirely revolutionized tomorrow. This is no excuse for not standardizing but is an argument for it. Some managers of steel companies, for example, were willing to let well enough alone, thinking that the investment they had in equipment was sufficient for all purposes and that it was folly to be continually remodeling. Carnegie, on the other hand, junked all his old equipment and installed modern machinery and methods. The result is well known. The office manager who has the courage of a Carnegie will win just as surely as the ironmaster did.[20]

By later standards, the equipment and methods of the early Carnegies of office management were crude, and represented merely the first response to the problem of the large-scale office. As in the factory, the solution to the problem was found first in the technical division of labor and second in mechanization. Although these are today aspects of the same process, historically they came about in stages, and it is preferable to separate them and deal first with the division of labor in office processes.

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The work processes of most offices are readily recognizable, in industrial terms, as continuous flow processes. In the main they consist of the flow of documents required to effect and record commercial transactions, contractual arrangements, etc. While the processes are punctuated by personal interviews and correspondence, these serve merely to facilitate the flow of documentation. We may take as our example the most common form of transaction, the sale of commodities; it will be understood that everything that takes place in this process has as its mirror image a corresponding process on the part of the firms on the other side, with the signs reversed.

The *customer order* is the cell of the process. It moves through a stream of records and calculations which begin with its appearance in the salesman's order book, or in the mail, or over the telephone, until it reaches its final resting place as an infinitesimal portion of the corporation's statement of financial condition. The order must be opened and examined. The customer must be clearly identified as to firm name, address for billing, separate address, if any, for shipping, and, most important, credit standing. (If the order comes with payment already attached, it becomes part of a tributary which subsequently rejoins the main stream.) The items ordered must be clearly and properly interpreted as to type and quantity. The correct discount must be chosen for each order in accordance with corporate sales policy, which is more or less complex and is stratified according to quantities ordered, type of customer, special arrangements, etc. An invoice or bill must be prepared listing the merchandise for shipment and extending quantities by unit price; this invoice must be totaled, discounted, and supplementary charges such as shipping or tax added. Now the invoice moves on to another stage: On the one side, some of its copies provide shipping documents for the shipping division and packing slips for the customer. On the other side, further copies provide the raw materials of the accounting procedure. In the latter process, the invoice totals are posted to accounts for sales on the one side and the customer's account (or cash) on the other. Customer accounts

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are further posted, in controlled batch totals, to an overall accounts-receivable account. At the same time, tabulations must be made from the invoice to record the depletion of inventory, to keep sales records on each stock item, as well as sales records by salesman and territory for the calculation of sales commission due, for charting sales trends, etc. Finally, the summaries of these various accounts, tested for internal consistency and balance with each other, form the raw materials for the monthly summary accounts and the statements of financial condition of the division or corporation.

In traditional form, this entire process was the province of the bookkeeper, with the assistance of other clerical help such as the order biller, junior clerk for posting, etc. But as soon as the flow of work becomes large enough, and the methods of office management are applied, the process is subdivided into minute operations. Characteristically, separate clerks open the mail, date and route the orders, interpret customer information, clear credit, check the items ordered for clarity and to see if they are in inventory, type an invoice, add prices to it, extend, discount, calculate shipping charges, post to the customer account, etc., etc. Just as in manufacturing processes —in fact, even more easily than in manufacturing processes— the work of the office is analyzed and parcelled out among a great many detail workers, who now lose all comprehension of the process as a whole and the policies which underlie it. The special privilege of the clerk of old, that of being witness to the operation of the enterprise as a whole and gaining a view of its progress toward its ends and its condition at any given moment, disappears. Each of the activities requiring interpretation of policy or contact beyond the department or section becomes the province of a higher functionary.

Needless to say, this conception is all the more readily applicable to those transactions which reflect no movement of physical commodities, such as banking and other financial transactions, the payment of insurance premiums and claims, and so on. But even those processes which, in an outsider's view, would appear to be difficult to subdivide in this way

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become, with sufficient volume, susceptible to the same treatment. Correspondence, for example, may be sorted into a variety of standard inquiries and problems and then answered with preformulated responses—either duplicated by machine or repetitiously typed (nowadays on automatic, tape-controlled typewriters). That smaller portion which requires individual treatment can be set aside for the attention of a higher grade of correspondence clerk while all the rest is classified, batched, and counted. On the basis of batch totals, the higher echelons of the office will then be able to see the type of inquiry or error which has caused the correspondence and use this as a check against other departments, or weigh these figures against past experience and against the experience of the trade as a whole. At the same time, the batch totals can be correlated with the time taken for dealing with correspondence of a particular sort, so that the expenditure of labor time may be kept under constant scrutiny and control.

In general, the rationalization of most office work and the replacement of the all-around clerical worker by the subdivided detail worker proceeds easily because of the nature of the process itself. In the first place, clerical operations are conducted almost entirely on paper, and paper is far easier than industrial products to rearrange, move from station to station, combine and recombine according to the needs of the process, etc. Second and more important, much of the "raw material" of clerical work is numerical in form, and so the process may itself be structured according to the rules of mathematics, an advantage which the managers of physical production processes often strive after but can seldom achieve. As flows subject to mathematical rules, clerical processes can be checked at various points by mathematical controls. Thus, contrary to the past opinion of many that office work was unlike factory work in that its complexities rendered it more difficult to rationalize, it proved easier to do so once the volume of work grew large enough and once a search for methods of rationalization was seriously undertaken.

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Mental and Manual Labor

In the beginning, the office was the site of mental labor and the shop the site of manual labor. This was even true, as we have seen, *after* Taylor and in part *because* of Taylor: scientific management gave the office a monopoly over conception, planning, judgment, and the appraisal of results, while in the shop nothing was to take place other than the physical execution of all that was thought up in the office. Insofar as this was true, the identification of office work with thinking and educated labor, and of the production process proper with unthinking and uneducated labor, retained some validity. But once the office was itself subjected to the rationalization process, this contrast lost its force. The functions of thought and planning became concentrated in an ever smaller group within the office, and for the mass of those employed there the office became just as much a site of manual labor as the factory floor.* With the transformation of management into an administrative labor process, manual work spreads to the office and soon becomes characteristic of the tasks of the mass of clerical workers.

Labor in general is a process whose determinate forms are shaped by the end result, the product. The materials and instruments used by the shoemaker, tailor, butcher, carpenter, machinist, or farmer may vary with the state of technology, but they must be adapted to the production of footwear, apparel, meat, wooden structures, metal shapes, or grain. The typical, although not exclusive, product of mental labor consists of markings on paper. Mental labor is carried on in

* In Lockwood's words: "One of the main changes in the division of labour has been the appearance of the specialized, semi-skilled office employee who is responsible for the 'processing' of data. The actual division of tasks very often preceded mechanization, but machinery has speeded up the trend by which a small group of executives, who make decisions about the selection and analysis of data, are separated from a mass of subordinates whose functions less and less justify their classification as brain workers." [21]

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the brain, but since it takes form in an external product—symbols in linguistic, numeric, or other representational forms—it involves manual operations such as writing, drawing, operating writing machines, etc.—for the purpose of bringing this product into being. It is therefore possible to separate the functions of conception and execution: all that is required is that the scale of the work be large enough to make this subdivision economical for the corporation.

Among the first to recognize this was Charles Babbage. Babbage was not only responsible for the design of one of the first calculating engines ("computers"), but in his *On the Economy of Machinery and Manufactures*, written in the 1830s, he included a prophetic chapter called "On the Division of Mental Labour," in which he subjected the matter to one of its earliest and most trenchant analyses. "We have already mentioned," he begins, "what may, perhaps, appear paradoxical to some of our readers,—that the division of labour can be applied with equal success to mental as to mechanical operations, and that it ensures in both the same economy of time." [22] This he demonstrates by the following example.

During the French Revolution, the adoption of the decimal system made it necessary that mathematical tables adapted to that system be produced. This task was given to a certain M. Prony, who soon found that even with the help of several associates he could not expect to complete the job during his lifetime. While pondering the problem, he happened to pass a bookseller's shop where Adam Smith's recently published *Wealth of Nations* was displayed, and opened it to the first chapter. He decided to put his logarithms and trigonometric functions into manufacture, like pins, and set up two separate workshops—the product of each to serve as verification for that of the other—for this purpose.

He divided the task among three sections. The first section, consisting of five or six eminent French mathematicians, was charged with the work of devising the formulas best adapted for use by the other sections. The second group, made up of

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seven or eight persons with a good knowledge of mathematics, undertook the problem of converting these formulas into numerical values and devising means of checking the calculations. The third section, varying in number from sixty to eighty persons, used nothing more than simple addition or subtraction and returned the results to the second section for checking. Babbage describes the process and its requirements as follows:

> When it is stated that the tables thus completed occupy seventeen large folio volumes, some idea may perhaps be formed of the labour. From that part executed by the third class, which may almost be termed mechanical, requiring the least knowledge and by far the greatest exertions, the first class were entirely exempt. Such labour can always be purchased at an easy rate. The duties of the second class, although requiring considerable skill in arithmetical operations, were yet in some measure relieved by the higher interest naturally felt in those more difficult operations.[23]

Of the third section, Babbage says: "It is remarkable that nine-tenths of this class had no knowledge of arithmetic beyond the first two rules which they were thus called upon to exercise, and that these persons were usually found more correct in their calculations, than those who possessed a more extensive knowledge of the subject." The way is thereby opened for two conclusions which capitalism finds irresistible, regardless of their consequences for humanity. The first is that the labor of educated or better-paid persons should never be "wasted" on matters that can be accomplished for them by others of lesser training. The second is that those of little or no special training are superior for the performance of routine work, in the first place because they "can always be purchased at an easy rate," and in the second place because, undistracted by too much in their brains, they will perform routine work more correctly and faithfully. It remains only to add to this story that Babbage foresaw the time when the "completion of a calculating engine" would eliminate the necessity for the

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operations of addition and subtraction performed by the third section, and that thereafter it would prove possible to find ways to simplify the work of the second section. In Babbage's vision we can see the conversion of the entire process into a mechanical routine supervised by the "first section" which, at that point, would be the only group required to understand either mathematical science or the process itself. The work of all others would be converted into the "preparation of data" and the operation of machinery.

The progressive elimination of thought from the work of the office worker thus takes the form, at first, of reducing mental labor to a repetitious performance of the same small set of functions. The work is still performed in the brain, but the brain is used as the equivalent of the hand of the detail worker in production, grasping and releasing a single piece of "data" over and over again. The next step is the elimination of the thought process completely—or at least insofar as it is ever removed from human labor—and the increase of clerical categories in which nothing but manual labor is performed.

Office Work as Manual Labor

The management experts of the second and third generation after Taylor erased the distinction between work in factories and work in offices, and analyzed work into simple motion components. This reduction of work to *abstract labor,* to finite motions of hands, feet, eyes, etc., along with the absorption of sense impressions by the brain, all of which is measured and analyzed without regard to the form of the product or process, naturally has the effect of bringing together as a single field of management study the work in offices and in factories. The modern "science" of motion study treats office and factory work according to the same rules of analysis, as aspects of the unvarying motions of human "operators." A typical handbook by a management engineer thus begins with a section headed "The Concept of the

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Universal Process," and in discussing work "in a shop, warehouse, store, office, or any other area," first takes pains to establish the *general applicability* of work measurement and production control systems to work of every kind: "Each situation presents a different surface appearance, and so the work which is performed in each of these diverse areas is ordinarily assumed to be very different. But a very marked similarity of basic purpose exists in all of these areas. . . . The universality of the process may be seen by analyzing that which goes to make up the process. To say that wherever humans labor they are performing the same types of work certainly seems to be a ridiculous statement. This seems to be even more inaccurate when it is remembered that much work is mental in nature, and not physical. But the statement is true." [24] "Universal standard data," the collection of which began with an eye principally toward factory work, are now applied at least as frequently to work in the office.

In addition, standard data have been collected specifically for office purposes, in the form of studies of particularly common office motions that are offered as interchangeable parts from which office managers may assemble their own complete operations. The Systems and Procedures Association of America, for instance, has assembled in compact form such a manual, entitled *A Guide to Office Clerical Time Standards: A Compilation of Standard Data Used by Large American Companies* (Detroit, 1960). The organizations which contributed their materials to this handbook are the General Electric Company, Stanford University, the General Tire and Rubber Company, Kerr-McGee Oil Industries, Inc., Owens-Illinois, Harris Trust and Savings Bank of Chicago, and the Chicago Chapter of the Systems and Procedures Association.*

* The tables in the *Guide* are published without direct identification of the source corporation, but the information given makes identification clear in most cases. Thus "Company A," from whose data most of the examples used here are taken, is identified only as a "large manufacturer of electrical appliances and allied products," but of the cooperating parties, the only

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The clerical standards maintained by these organizations begin with unit time values for the various elements of motion, as we have described in an earlier section, but they go on to agglomerate elemental motions into office tasks, and to offer the office manager the standards by which labor processes may be organized and calibrated. For example:

Open and close	*Minutes*
File drawer, open and close, no selection	.04
Folder, open or close flaps	.04
Desk drawer, open side drawer of standard desk	.014
Open center drawer	.026
Close side	.015
Close center	.027
Chair activity	
Get up from chair	.033
Sit down in chair	.033
Turn in swivel chair	.009
Move in chair to adjoining desk or file (4 ft. maximum)	.050

Walking time is tabulated for distances from one foot to a thousand feet, but since walking within the office requires many turns, "Walking (confined)" adds .01 minute for each turn. The reading of a one- to three-digit number is presumed to take .005 minutes, and of a seven- to nine-digit number, .015 minutes. To make comparison checks, going from one paper to another, is rated at .0026 minutes per character. To read typed copy, per inch: .008 minutes. And to write, not including "get" or "release" of pencil or pen:

Numerals, per number	.01 minute
Print characters, each	.01 minute

organization that fits this description is General Electric, which contributed the office standards used in its Distribution Transformer Department, manufacturer of heavy power-processing equipment. In what follows, we manage to catch a glimpse of the office standards and analyses under which modern office workers are actually supervised, whether they know it or not, and this is superior to looking at textbook standards.

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Normal longhand, per letter	.015 minute

For some reason, the operation called "jogging" is a favorite of office management experts, and is charted, analyzed, and timed in scores of studies. In this instance, the time for "jog" ("basic times, paper in hand") is given as follows:

1st jog	.006 minute
2nd or subsequent	.009 minute
Pat following jog	.004 minute
Pat following pat	.007 minute

In this table, the time for jogs from one to ten is given, and we are told to "add .01 for each jog over 10."

The time value for "Cut with scissors" is given as .44 minute, with ".30 for each additional snip." * "A snip," we are told, "includes opening, moving forward and closing the scissors." Tabulations are given for unit time values for rubber stamping, including the time for getting the stamp, checking the date setting, and putting it aside, and for stamping a series of sheets and putting *them* aside, with allowance for inking the stamp at every fourth impression. Also for the time required to collate, gather, lay aside, handle, punch, staple (or remove staples), rubber band (or remove), move material between stations, count, fold or unfold, open mail container (envelope) and remove contents, insert mail in container. Unit times are given for locating a single item in a drawer file, Kardex file, Linedex file, Speed-O-Matic file, binder or folder, log sheet, planning card, or at a specific position on a form. Times are given to file random items, to start a new file, to do numerical and miscellaneous filing, to enter or write, and at this point, still another chart for jogging.

Typing times are subjected to a stringent analysis. The

* Why it is that, when one is "jogging" or rapping a stack of papers to align them, the second jog takes longer than the first is not made clear. Nor is it clear why it should take almost half a minute to make the first snip with a scissors, and almost a third of a minute for each additional snip, unless these are misprints.

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conventional standards for words per minute are charted against minutes per inch; but beyond this, time values are assigned to the steps of handling the paper, inserting it in the typewriter, aligning (for various numbers of sheets and carbons), erasing, making strike-over corrections, and "handling material after." We are given such intelligence as the "fact" that back spacing (per space) requires .0060 minutes on a manual machine and .0025 on an electric model. Further tables cover the time required for various duplicating processes, by offset, spirit, and mimeograph. A tabulation covering the operation of a key-driven calculator includes time values for clearing the machine and turning over each sheet between calculations (.0120 min.).*

The charts used by Company B, which is described as a large manufacturer of rubber products, plastics, etc.—and is therefore presumably the General Tire and Rubber Company—offer a similar array of detailed tabulations. In addition to charts which duplicate, in other forms, the kind of materials we have already described, there are charts for pinning, clipping, counting cash, operating Pitney Bowes postage meters, matching papers, xeroxing, working bookkeeping machines, and an extraordinary table as follows:

Punch Time Clock

Identify card	.0156
Get from rack	.0246
Insert in clock	.0222
Remove from clock	.0138
Identify position	.0126
Put card in rack	.0270
	.1158

* All the charts taken from the standards of Company A bear the legend: "Bare standards—no allowances included for rest or personal needs." These are to be added, since modern capital is nothing if not meticulous and considerate.

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For the rest, tabulations supplied by other companies include, in addition to more of the same, time information for the operation of a great many office machines, including key punch and billing machines, and also for such bookkeeping functions as posting entries to ledgers by pen.

With the growing use of keyboard machines in offices, the analysis of the time requirements of operating them has become ever more intensive. For an example of this type of analysis, we turn to a 1963 volume called *Work Measurement in Machine Accounting*, two of the three authors of which were at the time of writing associated with the Ætna Life Insurance Co. In their treatment of key punching (the operation of the machine which punches holes in the eighty-column standard data-processing card), the authors arrive at the following breakdown of the time needed to punch a numeric character:*

	Unit time (TMUs)	*Frequency*	*Standard time (TMUs)*
Reach to key	1.6	1	1.6
Contact key	0.0	1	0.0
Depress key	1.7	1	1.7
Release key	1.7	1	1.7
Release contact with key	0.0	1	0.0
			5.0

Since a TMU is defined as one one-hundred-thousandth (.00001) of an hour, and there are thus 28 TMUs in each second, this means that a key punch machine is to be operated at the rate of 5⅗ strokes per second when purely numeric punching is being done. For the punching of alphabetical

* It is worth noting that this simple list of three unit times, with their total, is made into a "table" by the addition of two useless lines and two useless columns. This is typical of the manner in which management "experts" dress their presentations in the trappings of mathematics in order to give them the appearance of "science"; whether the sociologists have learned this from the schools of business administration or the other way around would make a nice study.

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characters, however, one additional TMU per stroke is allowed for "mental time." In this way, the Ætna specialists calculated that to punch numeric values in 26 columns, and alphabetic characters in 24, skipping over the other 30 columns, allowing for automatic duplication and allowing 20 TMUs (⅔ of a second), for consulting the information source, as well as 17.2 TMUs for additional handling, it should take .2295 minutes to punch the card and .2017 minutes for another operator to verify it on a second machine. Under 15 seconds per card is allowed, in other words, for key punching or for verification, including a 5 percent allowance for error. But since key punch operators have to handle work before and after punching, a further set of calculations is made in order to account for all the operator's time: a tabulation of 31 motions, including time for "stand," "sit," "get pencil," "initial cards," "open and close card clip," "open and close drawer," "get rubber band," "band cards," etc.[25]

In the clerical routine of offices, the use of the brain is never entirely done away with—any more than it is entirely done away with in any form of manual work. The mental processes are rendered repetitious and routine, or they are reduced to so small a factor in the work process that the speed and dexterity with which the manual portion of the operation can be performed dominates the labor process as a whole. More than this cannot be said of any manual labor process, and once it is true of clerical labor, labor in that form is placed on an equal footing with the simpler forms of so-called blue-collar manual labor. For this reason, the traditional distinctions between "manual" and "white-collar" labor, which are so thoughtlessly and widely used in the literature on this subject, represent echoes of a past situation which has virtually ceased to have meaning in the modern world of work. And with the rapid progress of mechanization in offices it becomes all the more important to grasp this.

The Mechanization of the Office

Machinery that is used to multiply the useful effects of labor in production may be classified, as we have seen, according to

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the degree of its control over motion. Insofar as control over motion rests with the operator, the machine falls short of automatic operation; insofar as it is rendered automatic, direct control has been transferred to the machine itself. In office machinery, however, the control over *motion* is generally incidental to the purpose of the machine. Thus the rapidity and precision of the high-speed printer are not required in order to print rapidly—there are other and faster ways to ink characters onto paper—but in order to record a controlled flow of information as it is processed in the computer. It is one part of a machine system designed to control not motion but *information.*

Information exists, in the main, in the form of a record of symbolic characters: the alphabet, numbers, and other conventional symbols. Until recently, the processing of these characters—that is to say, assembling and reassembling them in required forms and combining or analyzing them according to the rules of mathematics—was directly dependent upon the human brain. While various mechanical means for recording or combining them were in daily office use, such as the typewriter, the adding or calculating machine, and the bookkeeping machine, each of these machines could only carry or process information through a very short part of its total cycle before it again had to involve the human brain to move it into its next position. In this sense, the office process resembled a pipeline that required a great many pumping stations at very close intervals. The difficulty lay in the form in which information was recorded: so long as it took the form of a notation which could be apprehended only by the human senses, humans were required to seize it and move or manipulate it. Thus every key-driven mechanical adding or calculating machine depended on the line-by-line keyboard work of the operator, and its storage and processing facilities were limited to the capacities of a few mechanical registers. While this situation continued, every office machine remained on the primitive level of the hand tool, or power-assisted hand tool.

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The change began with the machine for counting punched cards invented by Dr. Herman Hollerith in 1885 and used to tabulate the United States census of 1890. The importance of this invention lay not in any technical advance, but entirely in the concept it embodied. In recording bits of data, each on its own card, by means of a system that gave to each column and rank of the card a specific meaning, the punched-card system made available a means of "reading" and "interpreting" simple data without direct human participation. Now, through one means or another of sensing the holes, machines could sort and classify, combine and tabulate, the bits of data on the cards. The significance of the method lay in the recasting of the form of the information so that it could be picked up by a machine.

This revolutionary conception passed through a series of purely technical improvements in the years that followed, first electromechanical, in which electrical impulses were made to control mechanical registers, and then electronic, in which information is handled and stored by means of the electrical impulses themselves and the mechanical elements virtually disappear. The effect upon the storage and handling capacities of computing systems has been enormous. In contrast to the punched card, which in its standard form stores eighty characters on a surface slightly larger than two playing cards, the common type of magnetic disk pack, which consists of eleven fourteen-inch disks mounted a half-inch apart, will hold up to 29 million characters. And these can be transferred at the rate of 156,000 characters per second to or from the computer processing unit, within which they may be manipulated in operations that are measured in millionths or even billionths of a second each. Thus once the information is recorded, bit by bit, by means of key-driven machines, it may be summoned, brought together from diverse sources, arranged, combined mathematically, etc., in very short periods of time, and the results displayed on a screen, or more commonly recorded by the high-speed printer which is itself a

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typewriter that puts to shame the combined efforts of scores of typists.

The computer system working on these principles is the chief, though not the only, instrument of mechanization of the office. Its first applications were for large-scale routine and repetitive operations which to some extent were already performed mechanically: payrolls, billing, accounts payable and accounts receivable, mortgage accounting, inventory control, actuarial and dividend calculations, etc. But it was soon applied in new tasks, such as for elaborate sales reports, production-cost accounting, market research information, sales commissions, and so forth, all the way up to general accounting, at which point the corporation's books of record are put into computerized form.

This automatic system for data-processing resembles automatic systems of production machinery in that it re-unifies the labor process, eliminating the many steps that had previously been assigned to detail workers. But, as in manufacturing, the office computer does not become, in the capitalist mode of production, the giant step that it could be toward the dismantling and scaling down of the technical division of labor. Instead, capitalism goes against the grain of the technological trend and stubbornly reproduces the outmoded division of labor in a new and more pernicious form. The development of computer work has been so recent and so swift that here we can see reproduced in compressed form the evolution of labor processes in accord with this tendency.

For a short time in the 1940s and early 1950s, the data-processing occupations displayed the characteristics of a craft. This was during the period when tabulating equipment based on the punched card dominated the industry. Installations were small and the tabulating craftsman worked on all machines: the sorter, collator, tabulator, calculator, etc.* These machines were programmed by wiring a panel board

* Except for the key punch machine; being a keyboard machine, this was immediately recognized as a job for "girls."

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for each machine, and this operation was learned as the worker gained a general familiarity with all the machines. Thus the equivalent of an apprenticeship was a period of learning the use of all the equipment, and the programming done at that time was simply the highest skill of an all-around trade.

The development of a data-processing craft was abortive, however, since along with the computer a new division of labor was introduced and the destruction of the craft greatly hastened. Each aspect of computer operations was graded to a different level of pay frozen into a hierarchy: systems managers, systems analysts, programmers, computer console operators, key punch operators, tape librarians, stock room attendants, etc. It soon became characteristic that entry into the higher jobs was at the higher level of the hierarchy, rather than through an all-around training. And the concentration of knowledge and control in a very small portion of the hierarchy became the key here, as with automatic machines in the factory, to control over the process.

The upper level of the computer hierarchy is occupied by the systems analyst and the programmer. The systems analyst is the office equivalent of the industrial engineer, and it is his or her job to develop a comprehensive view of the processing of data in the office and to work out a machine system which will satisfy the processing requirements. The programmer converts this system into a set of instructions for the computer. In early computer installations, the programmer was generally a systems analyst as well, and combined the two functions of devising and writing the system. But with the encroachment of the division of labor, these functions were increasingly separated as it became clear that a great deal of the work of programming was routine and could be delegated to cheaper employees. Thus the designation of "programmer" has by this time become somewhat ambiguous, and can be applied to expert program analysts who grasp the rationale of the systems they work on, as well as to program coders who take as their materials the predigested instructions for the system or subsys-

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tem and simply translate them mechanically into specialized terminology. The training for this latter work occupies no more than a few months, and peak performance is realized within a one- to two-year period. In accordance with the logic of the capitalist division of labor, most programmers have been reduced to this level of work.

Below this level, computer work leaves the arena of specialized or technical skills and enters the realm of working-class occupations. The computer operator runs the computer in accordance with a set of rigid and specific instructions set down for each routine. The training and education required for this job may perhaps best be estimated from the pay scales, which in the case of a Class A operator are on about the level of the craftsman in the factory, and for Class C operators on about the level of the factory operative.

The largest single occupation created by computerization is that of the key punch operator. Since it in many ways typifies the direction being taken by office work, it is worth examining in some detail.

The extraordinary swiftness with which computers process information depends in the first instance upon the careful preparation of a data base for the computer's use. While all other office functions dwindle in the face of the computer, this one tends to grow. First, everything which the computer digests must be translated into uniform codes. Second, the precalculated operation of the entire system depends upon the provision of adequate coding to cover every requirement at the time of entering the original data; nothing can be left for later recognition, apprehension, and action by the human brain if it is to be done by the computer in the course of its operations. Third, every preassigned code must be prepared for the computer in accordance with a strict and undeviating form so that it can have the desired effect. And fourth, this must be done in a relatively error-free way, since the computer does not recognize errors (except insofar as they transcend the parameters set in the program) but acts upon all the information it is given.

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This requires the preparation of data according to rigid forms because no matter how ingeniously the matter is approached, the computer cannot interpret any symbols but those that are undeviating as to form and position. The computer card, punched as desired by a key-driven machine and verified by a repetition on another such machine, is still the most common such form. It is not the only one, however, and a variety of other devices that record data on a magnetic tape, or print out symbols that can be "read" by an optical scanner, are now in use. Their advantage is not that they "eliminate key punching," as some hasty publicists have rushed to announce, but that they simplify the operation still further so that it may be performed on keyboards similar to that of the typewriter, and so divest the coding operation of even the very limited amount of training it now requires. Although the manner of coding may be varied, it cannot be eliminated; and while there are some ways in which the volume of coding may be held in check, in general it tends to grow with the growth of computerization. To describe key punching, therefore, is to describe the sort of work which, in this form or another, is growing rapidly in offices.

The training required for this sort of work has been described in one sociological study as follows:

> Card punching can be a rather monotonous job when it involves large masses of homogeneous data, pre-sorted and prepared in ready-to-copy columnar format. The job can be learned in a matter of a week or two, and satisfactory production skills can be attained within some six months. Despite most employers' stated preference, a high-school diploma is not essential for satisfactory performance. Some training officials estimated that a ninth-grade reading level and equivalent proficiency in arithmetic provide a good starting base.
>
> For all these reasons, a highly knowledgeable personnel man, in the course of one interview, described keypunch operating as a "semi-blue-collar" job. He considered the term descriptive not only of the nature of the job, but also of the entry requirements,

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> both formal and informal. In many instances girls who lack formal education or the "social graces of the office" can be placed in keypunching, whereas they would probably be rejected for other purely white-collar work.[26]

The authors of this study, who like most of their colleagues in the social sciences prefer to look on the bright side, profess themselves "intrigued" by the view expressed by this personnel manager. They are quick to theorize that key punching can become a handy substitute for unskilled manufacturing jobs which in the past "served as the first step on the ladder." But within a page they themselves are forced to characterize key punching as a "dead-end" occupation: "Whereas messengers are frequently promoted to file clerks, file clerks to typists, and typists to secretaries, keypunch operators tend to remain keypunch operators." [27]

The work itself is described by key punch department managers themselves as "extremely boring" with "no intelligence looked for" and a very high turnover rate.[28] Here is a description, reported on the occasion of the changeover from a pre-computer tabulating machine system (which also required punched cards) to a computer system:

> One key-puncher reported that before the installation of the computer, her work had been somewhat varied and had occasionally called for the exercise of judgment. This had made it bearable. Every three or four weeks, as the conversion to automation proceeds, several of her associates are transferred from the original group of key-punchers and assigned to the new work, which is more monotonous and repetitious. Since there is no variation in job content, the pace is continuous, steady, and "pressured." The most frequent comment among the girls is, "We are working for the machine now."
>
> Mrs. Duncan described all key-punch girls as "nervous wrecks." "If you happen to speak to an operator while she is working, she will jump a mile. You can't help being tense. The machine makes you that way. Even though the supervisor does not keep an official production count on our work, she certainly knows how much each of us is turning out—by the number of

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boxes of cards we do." Mrs. Calvin, a former operator for a different company, reported the same kind of tension: "If you just tap one of them on the shoulder when she is working, she'll fly through the ceiling."

Both women reported that absenteeism was very high among their group. Mrs. Duncan remarked, "Someone is always saying, 'I don't think I'll come in tomorrow. I just can't stand this any longer.' " Although the girls do not quit, they stay home frequently and keep supplies of tranquilizers and aspirin at their desks. The key-punchers felt that they were really doing a factory job and that they were "frozen" to their desk as though it were a spot on the assembly-line.[29]

As in the factory, the machine-pacing of work becomes increasingly available to office management as a weapon of control. The reduction of office information to standardized "bits" and their processing by computer systems and other office equipment provides management with an automatic accounting of the size of the work load and the amount done by each operator, section, or division:

Precise measurement of clerical output is one of the aspects of the production room approach heightened by if not exclusively new to automated offices. Simplification and routinzation of office tasks by automation makes the work much more amenable to objective count and measurement. The American Management Association has published numerous studies reporting the experience of various large firms in developing clerical cost programs by means of time measurement of office operations. These articles refer only indirectly to employee irritation and resistance. In the Standard Oil Company of Ohio, for example, a special name was coined to avoid such terms as "work measurement," which was considered to be "irritating to the employees and made it difficult to secure their participation."

The Seventh Annual Conference on Systems and Procedures in 1958 stressed that the systems profession is devoted to methods improvement or "working smarter." Implicit in this was the job of motivating the office worker to greater productivity. Henry Gunders, associate director, Management Advisory

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Services, Price Waterhouse and Company, Houston, Texas, maintained that in the unmeasured office the rate of clerical output is low. He estimates that such an office is operating on 50 to 60% efficiency, and that with clerical output measured, even unaccompanied by incentives, there would be a 20 to 30% increase in output. It is stated that incentives are most applicable to already mechanized jobs. When an office machine is used, various devices such as stroke counters, automatic sequential numbering, and the like simplify counting. Similarly, prenumbered documents, processed in sequence, facilitate production counting.

Most of the firms included in this study quantify the operations associated with data-processing. Key-punching, in particular, lends itself to objective count. Government agencies and private business firms reported that this type of work measurement was standard procedure. In some instances, the girls fill out a daily tally form indicating how many inches they have punched, and the verifiers keep count of the errors. An executive of one large insurance company commented that, although it is not generally mentioned, an objective record of productivity is kept, and the operator whose output lags is fired. Many firms rely on the supervisor to keep a visual check which can be objective because she would know the total number of trays of cards processed during any period. One official explained that the careful tally of key-punch output in his firm was made necessary because all service functions must be allocated as to cost, and that check on operators' speed was a secondary consideration. Serial checking on other types of office equipment is the method used by many firms, and is applicable to calculators, check sorters and various machines besides key-punches. "Industrialization" of clerical work is evident not only in the work count, but also in the use of a moving belt to carry the work from one station to the next. Several companies studied use this method of carrying orders from the point of origin through the various stages of processing to the computer.

The factory atmosphere is unmistakably present. Not only are the office machine operators often required to punch a time clock, but they are not permitted to converse while at work. They are subject to dismissal with as little notice as a week or at most a month. There are few distinguishing marks between the

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> employee in the electronic office and the factory worker in light manufacturing.[30]

As work has been simplified, routinized, and measured, the drive for speed has come to the fore. "Everything is speed in the work now," said a woman who found herself near a nervous breakdown, and the pace is "terrific." And with the economies furnished by the computer system and the forcing of the intensity of labor come layoffs which selectively increase the tendency toward factory-like work: "With each reduction in force, the remaining workers are told to increase their output. Automation has reduced the staff in that office by more than one-third, and more mechanization is in prospect. The union spokesman said that the categories of jobs which have disappeared are those which require some skill and judgment. Those remaining are the tabulating and key-punch operations, which become even simpler, less varied, and more routinized as work is geared to the computer." The vice-president of an insurance company, pointing to a room filled with key punch operators, remarked: "All they lack is a chain," and explained himself by adding that the machines kept the "girls" at their desks, punching monotonously and without cease.* And the workers themselves are under no illusions about their "white-collar" jobs: "This job is no different from a factory job except that I don't get paid as much," one operator in a large farm-equipment office said.[31]

The educational requirements for this new kind of office work are subject to confusion, some of it deliberate, between the needs of the work itself and other considerations. Thus the authors of a recent study of electronic data-processing in New York write:

> We have already noted the general tendency of employers to specify a high-school diploma as a prerequisite to employment

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* This vice-president gives us a clear illustration of the fetishism which puts the blame for the situation on the "machines" rather than on the social relations within which they are employed. He knew when he made this remark that it was not the "machines" but he himself who chained the workers to their desks, for in his next breath he pointed out that a count of production was kept for the workers in that machine room.

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> for keypunch operators. It is also true, however, that many successful* operators are hired without the diploma, particularly in a period when the labor market is tight. Our interviews convinced us that a high-school diploma is viewed as something other than a certification of academic or intellectual proficiency.
>
> Some firms, admittedly, relish their ability to state that "all our employees are high-school graduates," as an indication of status or prestige. The great majority, however, view the diploma as a certification of responsibility, motivation, and reliability. . . . "Sure, we can find out quickly if a girl can really punch cards. But will she come in every Monday? Will she stay after 5 o'clock when we're pushed for overtime? Will she drift to another job after three weeks?" These are the kinds of questions that were repeatedly raised by employers.[32]

Earlier in the computer era, various managements not yet oriented in the field and perhaps somewhat deceived by their own glowing estimates of the mass "upgrading of the labor force" that would take place, hired the "wrong kind of labor." This was particularly true in banking, where the snobbish tradition of "superior" employees had not yet been overcome by managers. Thus in one study of bank computerization it was decided that personnel managers were "recruiting girls of too high an intellectual calibre for the new simple machine jobs." [33] Experience soon showed, in the words of another study of technological change in banking, that "it would be misleading to assume that a massive upgrading will take place, for a large proportion of jobs created up to this point are relatively low rated. Encoders are a case in point: Encoding 'is a low-grade job which is easily and quickly learned, requiring only the ability to operate a 10-key keyboard.' At one bank, 'Due to the simplicity of operator training for single pocket proof encoders, the job, as related to our job evaluation scale, has been downgraded three grades and reduced from an

* This term in itself is quite remarkable, and can only be understood if taken to mean key punch operators who turn out to be "successful" hiring strokes for the personnel manager.

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average base of $68 to $53 per week.' * An EDP clerk is only 'a slightly higher grade position than that of encoder. . . .' At the large branch bank referred to above, approximately 70 percent of the jobs created were low rated, while at the small branch bank they comprised around 50 percent of the new jobs." [35] And it is in the nature of the organization of work around the computer system that, like factory work, it does not have the advancement ladder characteristic of the bank and office of several generations ago. This was recognized early in the computer era by the American Management Association, which, in a special report designed to help employers set up data-processing operations, said: "To be honest—we don't want people to take data-processing jobs as stepping stones to other jobs. We want permanent employees capable of doing good work and satisfied to stay and do it. To promise rapid advancement is to falsify the facts. The only rapid advancement for the bulk of nonsupervisory data-processing staff is *out of data-processing!*" [36]

So far as the traditional grades of office labor are concerned, the computerization of office accounting procedures further weakens the position of those skilled in the system as a whole, particularly bookkeepers. The decline of the bookkeeper, which had begun, as we have seen, with the rise of the office manager, was helped along by the rise of the bookkeeping or posting machine, which converted a certain amount of skilled ledger work into a mechanical operation. The decline was continued, especially in banking, by the development of electronic bookkeeping machines, which complete the conversion of bookkeepers into machine operators and at the same time reduce the demand for them sharply. Thus one multibranch bank reported that within eighteen months after installing electronic bookkeeping machines, the bookkeeping

* These pay figures refer to 1963. Elsewhere, the job of coder is characterized thus by a data-processing executive: "The only gal who will stick with this work has to have a husband with two broken legs and five hungry kids. No one else could stand it." [34]

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staff of 600 had been reduced to 150, and the data-processing staff had grown to 122. This is in line with the experience of most banks, which achieve a reduction in overall labor requirements of 40 to 50 percent for the same volume of work, and in the process cut down the bookkeeping people sharply and replace them with machine operators.[37]

Not only bookkeepers, but even the lower grades of management, feel the effects in a similar way. The computer presents management with an enormous temptation to save management time as well as labor time by "mechanizing" many choices and decisions. It is probably for this reason that Howard C. Carlson, a psychologist employed by General Motors, has said: "The computer may be to middle management what the assembly line is to the hourly worker." [38]

The tendency of the labor process exemplified in the various machine jobs is not confined to the workers grouped immediately around the computer. On the contrary, with the exception of a specialized minority whose technical and "systems" skills are expanded, this tendency increasingly affects all clerical workers. The reasons for this may be separated into two parts.

First, the formal demands of computerization extend far beyond those machine operators who work with the raw materials or finished products of the computer. Since coding operations are performed mechanically according to fixed layouts, the materials prepared by others for the machine rooms must also follow strict rules of form. Thus the clerk who uses nothing but paper and writing instruments, and who apprehends the information in the first instance from original source documents, is governed by the same rules of form. This has led to the possibility of transferring the work of the key punch operator to the other grades of clerk, a change which is now under way and which will undoubtedly accelerate. Under this system, the work of transcribing information into a form that can be used by the computer is spread throughout the office instead of being localized in machine rooms, by means of terminals or other simple keyboard machines that can be

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operated by any clerk. In this way, machine operation is generalized throughout the office. If, in the first instance, this involves a combination of jobs—that of interpreting being combined with that of keyboard operation—the next step is the simplification and even elimination of the judgmental steps involved in interpretation by tying the new keyboard machine to the computer and utilizing its storage and swift-search capacities. Thus, in a variety of ways, the reduction of data to symbolic form with accurate positional attributes becomes, increasingly, the business of the office as a whole, as a measure to economize on labor costs.

Second, a variety of other machines and systems are applied to other work processes not within the immediate orbit of the computer. For example, file clerks serve elaborate and semi-automatic machine systems which eliminate the need to know the sequence of the alphabet, or even the sequence of numbers; everything is eliminated but the task of placing under the photographic apparatus of the machine, as swiftly as possible, one document after another. Typists, mail sorters, telephone operators, stock clerks, receptionists, payroll and timekeeping clerks, shipping and receiving clerks are subjected to routines, more or less mechanized according to current possibilities, that strip them of their former grasp of even a limited amount of office information, divest them of the need or ability to understand and decide, and make of them so many mechanical eyes, fingers, and voices whose functioning is, insofar as possible, predetermined by both rules and machinery. As an important instance of this, we may note the changes in the work of the bank teller, once an important functionary upon whose honesty, judgment, and personality much of the public operation and relations of the bank depended. Attached to mechanical and electronic equipment, these employees have been transformed into checkout clerks at a money supermarket counter, their labor power purchased at the lowest rates in the mass labor market, their activities prescribed, checked, and controlled in such a way that they have become so many interchangeable parts. And it should be

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added that the teller's function, limited as it now is, will gradually be replaced by new mechanical-electronic equipment that originated in England and has been spreading in the United States. A cash machine which, activated by a customer card, supplies cash from the customer's account is no more than the first tentative step in this direction. So-called automated tellers are able, on the same principle, to transact any of a number of banking functions, including deposits to or withdrawals from savings or checking accounts, transfers between accounts, and loan repayments.[39] Such equipment requires not so much a revolution in banking technology as the modification of existing equipment so that it may be used directly by the customer, with minimal opportunity for error or fraud. The fact that this is becoming increasingly common in trade and service areas indicates that much automated equipment is so simple to operate that it requires *no training whatsoever;* it also foreshadows the weakening of the demand for labor in fields of employment that have been expanding rapidly.

The trend in what is known as "secretarial work" assumes great importance in this transformation of clerical labor, for two reasons. First, it is an occupational category of enormous size. Some 2.75 million persons were employed as secretaries in the United States in 1970, according to the census for that year, almost all of them women. This is the largest single category of clerical labor. And second, we are at the beginning of a revolution in this field which will transform the office almost to the same extent as it is now being transformed by the computer. To understand this incipient upheaval, we must review this occupation and its fundamental rationale.

From a functional standpoint, the secretary came into existence as a device to extend the administrative scope of the entrepreneur and proprietor. Later, as the managerial structure grew, the secretary, from this same functional standpoint, came to represent a pure expression of the Babbage principle: it was thought "wasteful," from the capitalist point of view, to have a manager spend time typing letters, opening mail,

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sending parcels, making travel arrangements, answering the telephone, etc., when these duties could be performed by labor power hired at anywhere from one-third to one-fiftieth of the remuneration of the manager. But here the operation of the Babbage principle is further stimulated by the fact that the managers are organizing not the distant labor processes of subordinates, but *their own* labor. Since they tend to place an exaggerated value upon their own time, and a minimal value upon the time of others as compared with their own, the Babbage principle goes to work in the offices of managing executives with particular force, all the more so as it is intensified by the prestige attaching to managers with large staffs, the usefulness of a retinue of office servants for the transacting of personal matters, and other career, social, and personal considerations.

Thereafter this system of secretarial assistance spreads to lower ranks as well, as the numbers of managerial and semi-managerial employees increase. Since the Babbage principle operates wherever a mass of work may be subdivided and its "lower" portions separated out and delegated, it invades all the realms of paper work performed by "executives," assistants to executives, heads of small departments sometimes consisting of no more than the "head" and a secretary, professional and even semi-professional employees. The Babbage principle has here transcended its own limits, especially as social and prestige factors come into play and the personal secretary becomes a perquisite of the privileged job as one of its chief privileges. Top managers watched this multiplication of secretaries with nothing more than amusement, until it grew to dimensions which threatened the balance sheet.

For management to tackle this monstrosity in order to reduce the drain on the corporate pocketbook is by no means simple. It is not just a matter of attacking a traditional and entrenched privilege, but one which is enjoyed by the lower reaches of the managerial structure itself, those whose loyalty and interest in the corporation is guaranteed by, among other things, these very trappings and pretenses of managerial

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status. Corporate managements confront the danger, in any such attack, of alienating their own instruments of control over the administrative structure. True, some managements have not allowed such a situation to develop, or have destroyed it at an earlier stage—stenographic pools as a substitute for personal secretaries, for example, are hardly unknown—but many others have shrunk from the task. There is ample evidence, however, that this situation is ending, and that management is now nerving itself for major surgery upon its own lower limbs.

The reasons for this new attitude are various. The most important has already been mentioned: the extent to which this expensive practice has burgeoned, and the immense amounts of payroll it devours, not just through the multiplication of secretaries but through the effect of this arrangement upon the entire functioning of the office. But there are other factors: the completion of the basic work of rationalization in the factory, so far as it can be carried through, freeing management to turn to the office; the maturation of "systems thinking" among managers to the point where they have reconceptualized the entire problem; the spread of the methods of close calculation throughout smaller firms that might otherwise escape them for a while longer, through the purchase of such firms by conglomerates whose first step is to send in systems engineers (and here the fact that the blame for the changes can be assigned to distant proprietors makes the installation of new systems by corporate management somewhat easier); the perfection of various cheap systems of centralized communications and recording; even the new attitudes of women, who dispute and scorn the body-servant role and make it more difficult to recruit tractable secretaries —all of these are among the factors which both encourage and facilitate the ending of the secretarial explosion.

Office managements have thus entered upon a sweeping campaign to destroy what they call the "social office," to use a phrase which has recently gained popularity.[40] It is only necessary to follow the periodicals published for top office

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managers, such as *Administrative Management*, to see that they are attacking on this front not only with a newly systematized armamentarium of ideas and procedures, but with a fresh determination, and that the object of this attack is no longer just the clerk but the comfortable arrangements made by their own lower managers.

There is of course no disposition on the part of office managements to reject the Babbage principle and to have those functionaries who are now assisted by secretaries begin to do their own typing and other chores. This would contradict the basic tenet of management that each task must be performed at the lowest possible rate of pay. Rather, they feel that the time has come to end a system which makes of each functionary a supervisor over the labor of one assistant, because the labor time of secretaries is used wastefully and inefficiently, is subject only to relaxed and friendly supervision by a superior who is more interested in personal convenience than in office efficiency, and because such functionaries cannot, as a rule, delegate enough work to fully occupy the time of another person.

Secretarial work is analyzed into two parts: typing and administrative routine (sometimes reception and telephone answering are separated from the latter as a distinct function). The first is being made the business of what has been named the "word processing center." This center is a modernized version of the stenographic pool; it does not send stenographers to take dictation from executives, but rather gives each executive a link with the stenographic process through the telephone on his end and recording equipment on the other. These recordings are then "processed" by typists, and the finished letter, document, brief, contract, script, or any other form requiring typing is brought by messenger for checking and signature. As distinguished from a stenographic pool, which merely held and dispatched labor power to departments as required, this system visualizes the construction of a separate production department whose business it is to manufacture to order all the correspondence and other documen-

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tary work required anywhere throughout the offices of the enterprise. Thus this major portion of the secretarial job now becomes the province of production workers, assisted by electronic equipment. Not unexpectedly, this concept and its application have made the furthest strides in Germany, and an article in *Administrative Management* describes the stress given there to the use of canned texts and automatic typewriters. Word processing is

> a process of having word originators (executives, sales correspondents, lawyers, and the like) select formula clauses from pre-coded, pre-organized clause books. For example, an administrator who would normally dictate the same kind of reply to a letter several times a day, instead selects the appropriate clauses (by code number) from the clause book—or from memory if he's used them often enough. Once selected, clause codes plus individual names, addresses and other variable inserts (such as dates or prices) are either dictated into recorders or jotted down on "to-be-typed" forms. This source dictation or form is then used by the typist to prepare a final letter. Automatic typewriters repetitively type the "canned" clauses, and the typist manually keyboards in the new or variable data. . . . benefits are word originator and typist efficiency, and more work produced from the same number of hours on the job. In addition, less training is required of all the people involved.[41]

This last "benefit," the reduction of training for "all," indicates the sensitivity of management to the proliferation of correspondents and other such "word originators," each of whom is required to know how to formulate a passable paragraph so that it may be understood by the recipient; under the new system, this requirement disappears, leaving only the ability to *select the proper paragraph.*

The other functions of the secretary are taken over by an "administrative support center." The superior who formerly had a secretary is known, in relation to this center, not as a "word originator" but as a "principal," and it is considered that a ratio of four to eight principals to each "administrative support secretary" will prove adequate. This support center

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handles all the nontyping chores formerly required of the secretary, foremost among them being filing, phone answering, and mail handling. "Filing," we are told, "should be performed in the support center—not in the principal's office." The clear objective of such arrangements is to prevent the renewal of the previous situation by imperceptible degrees, and to ensure that all secretarial work is performed under centralized production supervision and not under the supervision of the "principal." Moreover, "principals should answer their own phone, but the phone should also ring in the center so if the principal doesn't pick it up by the third ring the secretary can get it." Like the "word processing center," the "administrative support center" is connected to the various offices by phone and messenger service.[42]

Thus, under the new arrangement, the secretarial function is replaced by an integrated system which aims at centralized management, the breakdown of secretarial jobs into detail operations subdivided among production workers, and the reduction of the number of secretarial workers to one-half, one-quarter, or even smaller fractions of their former number. Among the subsidiary benefits management expects to derive from this arrangement is the reduction and thus cheapening of the skills of administrative employees, and, not the least, the squeezing out of the minutes and hours of labor power lost in the personal relations and contacts among secretaries and between secretaries and their "principals"—which is what they mean when they speak of the "end of the social office." The force and seriousness of this campaign, which has begun in this form only in the past few years, can be seen not only from its conception as a total system with its own jargon, technology, and specialists, and from the space now being devoted to it in office management periodicals, but also from the launching of new periodicals and organizations devoted entirely to this subject (for instance, *Word Processing Report* and the Word Processing Institute). The total system has been installed in a great variety of corporations, including sophisticated publishing offices in New York, where systems analysts

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have shown themselves to be sturdy of purpose and impervious to the barbed comments of editors who are being deprived of their secretaries.

We have now described, in its major facets, the conversion of the office routine into a factory-like process in accordance with the precepts of modern management and available technology. The greatest single obstacle to the proper functioning of such an office is the concentration of information and decision-making capacity in the minds of key clerical employees. Just as Frederick Taylor diagnosed the problem of the management of a machine shop as one of removing craft information from the workers, in the same way the office manager views with horror the possibility of dependence upon the historical knowledge of the office past, or of the rapid flow of information in the present, on the part of some of his or her clerical workers. The recording of everything in mechanical form, and the movement of everything in a mechanical way, is thus the ideal of the office manager. But this conversion of the office flow into a high-speed industrial process requires the conversion of the great mass of office workers into more or less helpless attendants of that process. As an inevitable concomitant of this, the ability of the office worker to cope with deviations from the routine, errors, special cases, etc., all of which require information and training, virtually disappears. The number of people who can operate the system, instead of being operated by it, declines precipitously. In this sense, the modern office becomes a machine which at best functions well only within its routine limits, and functions badly when it is called upon to meet special requirements.*

* Managers often wag their heads over the "poor quality of office help" available on the labor market, although it is their own system of office operations which is creating the office population suited to it. This complaint is, unfortunately, too often echoed by unthinking "consumers" when they run into trouble with an office, as they often do. Such difficulties will tend to increase in the same way that the quality of factory production tends to decline and the servicing of consumer appliances tends to worsen even as it becomes more expensive, and for the same reasons.

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The Class Position of Clerical Labor

While the working class in production is the result of several centuries of capitalist development, clerical labor is largely the product of the period of monopoly capitalism. Thus the early post-Marx attempts to analyze this phenomenon were severely hampered by the fact that clerical work was as yet little developed as a capitalist labor process. For example, in the discussion of the subject in the German Social-Democracy before the First World War, Emil Lederer (whose *Die Privatangestellten in der Modernen Wirtschaftsentwicklung* was probably the most substantial and important product of the debate) commented on the stagnant technical conditions of the office:

> Indeed, the modern commercial employee resembles the commercial employee of the past more than the labor employed by large-scale industry resembles the journeyman of the Middle Ages. Methods of doing business have hardly changed in the majority of cases. Even large-scale enterprises are only expanded small-scale business. Since no new technique has come to the fore, they exhibit no essentially new methods.[43]

In these discussions, the participants were impressed by the rapid growth of the office; but the changes in office labor, still in their infancy, could not make so great an impression. The general expectation of commentators, as a result, was the rapid increase of office functionaries of the then-dominant varieties. On this basis, the conclusion seemed inescapable: a very large new "middle class" was coming into being.

This conclusion was further guaranteed by the penchant, which continues down to the present day, for defining the class positions of various varieties of office labor on the basis of secondary characteristics. In keeping with this, all the labor of the office is lumped together under such rubrics as "white collar," or "salaried employees." This is nothing but a hangover from the days in which all office labor did share the

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characteristics of privilege in pay, tenure, authority, etc. In that earlier situation, such designations, when applied to all who worked in offices, served as shorthand expressions for the special position of such employees. It was not the color of the employee's collar, still less the mode of payment on an annual or monthly basis as distinguished from the daily or hourly wage of the manual worker, that in themselves had a determinate meaning, but rather the whole complex of social position and position in the enterprise and the labor process that these terms symbolized.*

In 1896, Charles Booth was able to write: "The 'average, undifferentiated human labour power' upon which Karl Marx bases his gigantic fallacy does not exist anywhere on this planet, but least of all, I think, is it to be found among clerks." [44] At the time there were few Marxists bold enough to try to counter this thrust. But within less than forty years the development of the capitalist office made it possible for some to comprehend all the essential elements of the process, although it was even then far from being well advanced. Thus Hans Spier, drawing chiefly on German experience, was able to write in 1934:

* The continued use of this terminology long after the realities behind it have disappeared is one of the greatest sources of confusion in the analysis of this subject. A term which lumps together into a single class grouping the authoritative executive representing capital on the one hand, and the interchangeable parts of the office machine which serves him on the other, can no longer be considered useful. This terminology is, however, considered serviceable by those who are alarmed by the results of a more realistic terminology—those, for instance, whose "sociology" pursues apologetic purposes. For them, such terms as "white-collar employees" conveniently lump into a single category the well-paid, authoritative, and desirable positions at the top of the hierarchy and the mass of proletarianized inferiors in a way that makes possible a rosier picture: higher "average" pay scales, etc. In this use of the term, the "white-collar" category tends to get its occupational flavor from the engineers, managers, and professors at the top of the hierarchy, while its impressive numerical masses are supplied by the millions of clerical workers, in much the same way that the stars of an opera company occupy the front of the stage while the spear-carriers provide the massive chorus.

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The social level of the salaried employee sinks with the increasing extent of the group. This qualitative change, which has been termed "the proletarianization of the white collar worker," shows itself in a number of ways. It is most evident, perhaps, in the especially great increase in the women salaried workers, who mostly perform subordinate work. . . . It is the man who typically has the principal authority, the girl who is typically the subordinate. . . . The great increase in salaried employees is especially traceable to a demand for subordinates, not for fully qualified responsible persons. As a result the average chance of advancing has declined. The majority of the subordinate employees in the large offices perform duties which are specialized and schematized down to the minutest detail. They no longer require general training; in part only a very limited and brief training is necessary, in part previous training has become quite unnecessary. The process in the course of which the body of salaried employees become a mass group rests on the successful attempt to replace the personal experience of the individual by a rational scientific business administration, so that an increasing proportion of the workers can be changed without danger to the efficiency of the enterprise. One social result of this development is the rise of the unskilled and semi-skilled salaried workers, whose designation already indicates the assimilation of the processes of work in the office to that in the factory. In the case of the salaried workers who serve as subordinates on one of the many modern office machines, or, for example, who sell in a one-price store, the difference in the nature of the duties between such workers and manual workers is completely wiped out . . . especially revealing with regard to the sinking of the social level of the white-collar workers is, finally, the change in the social antecedents. The growing tendency to employ salaried workers of "proletarian origin" indicates that the number of untrained and poorly paid positions is increasing faster than the number of middle and principal positions. In other words, the salaried employees as a whole are being subjected to a process of decreasing social esteem.[45]

This was written before the mechanization of the office. Writing at about the same time, Lewis Corey was anticipating future events when he said: "The mechanization of clerical

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labor becomes constantly greater; a typical large office is now nothing but a white-collar factory." [46] But by 1951, much of the anticipatory element had disappeared and C. Wright Mills was able to write, upon a solid basis of fact:

> The introduction of office machinery and sales devices has been mechanizing the office and the salesroom, the two big locales of white-collar work. Since the 'twenties it has increased the division of white-collar labor, recomposed personnel, and lowered skill levels. Routine operations in minutely subdivided organizations have replaced the bustling interest of work in well-known groups. Even on managerial and professional levels, the growth of rational bureaucracies has made work more like factory production. The managerial demiurge is constantly furthering all these trends, mechanization, more minute division of labor, the use of less skilled and less expensive workers.
>
> In its early stages, a new division of labor may specialize men in such a way as to increase their levels of skill; but later, especially when whole operations are split and mechanized, such division develops certain faculties at the expense of others and narrows all of them. And as it comes more fully under mechanization and centralized management, it levels men off again as automatons. Then there are a few specialists and a mass of automatons; both integrated by the authority which makes them interdependent and keeps each in his own routine. Thus, in the division of labor, the open development and free exercise of skills are managed and closed.
>
> The alienating conditions of modern work now include the salaried employees as well as the wage-workers. There are few, if any, features of wage-work (except heavy toil—which is decreasingly a factor in wage-work) that do not also characterize at least some white-collar work. For here, too, the human traits of the individual, from his physique to his psychic disposition, become units in the functionally rational calculation of managers.[47]

To these pictures of the merging characteristics of clerical and production labor, it is now possible to add a number of important details.

The use of automatic and semi-automatic machine systems

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in the office has the effect of completely reversing the traditional profile of office costs. A situation in which the cost of operating a large office consisted almost entirely of the salaries paid to clerical employees has changed to one in which a large share of the total is now invested in the purchase (or paid out monthly for the leasing) of expensive equipment. Past or "dead" labor in the form of machinery owned by capital, now employs living labor, in the office just as in the factory. But for the capitalist, the profitability of this employment is very much a function of time, of the rapidity with which dead labor absorbs living. The use of a great deal of expensive equipment thus leads to shift work, which is particularly characteristic of computer operations.

At the same time, the employment of machinery pushes the office installation toward the warehouse and industrial districts of the cities. This is facilitated by the development of remote terminals and other communications devices which annihilate distance and do away with almost all the inconveniences of separate installations, so that executive offices can be maintained in the more expensive and accessible locations while the mass of clerical workers can be moved into lower-rent districts, often together with warehousing or production facilities. Thus the convenience and cachet of working in the central part of town, with its greater shopping interest and more varied lunching facilities, etc., begins for many clerical workers to disappear.

At the same time, the labor market for the two chief varieties of workers, factory and office, begins to lose some of its distinctions of social stratification, education, family, and the like. Not only do clerical workers come increasingly from families of factory background, and vice-versa, but more and more they are merged within the same living family. The chief remaining distinction seems to be a division along the lines of sex. Here the distribution within the clerical and operative groups is strikingly congruent: in 1971, the category of operatives was made up of 9 million men and 4 million

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women, while that of clerical workers was made up of 10.1 million women and 3.3 million men. The sex barrier that assigns most office jobs to women, and that is enforced both by custom and hiring practice, has made it possible to lower wage rates in the clerical category, as we have seen, below those in any category of manual labor. The growing participation of women in employment has thus far been facilitated by the stronger demand for clerical employees and the relatively stagnating demand for operatives. The existence of two giant categories of labor, operatives and clerical workers, as the two largest major occupational classifications, and the composition by sex of each of these categories, leads to the conclusion that the most common United States occupational combination within the family is one in which the husband is an operative and the wife a clerk.

The tendency of modern capitalist employment, in which a vast mass is occupied on a less and less differentiated level of general labor, was recognized early by Theodore Caplow and well portrayed by him in the following passage:

> Near the midpoint of the occupational status scale, where white-collar and manual levels overlap, there are a vast number of employments which are usually called "semiskilled." As a matter of fact, most of them cannot be readily evaluated in terms of skill. Their common characteristic is that no lengthy experience is required to perform the work, and that movement from one occupation to another is easy and frequent. Indeed, the mark of a semiskilled occupation is its vagueness. Unlike the higher and lower portions of the scale, this great central cluster of factory and office jobs is not clearly compartmentalized. Lifetime involvement in a job is rare. Men and women perform comparable work under comparable conditions. Job titles do not correspond to organized social groupings; and each occupation merges into many others. All these factors together contribute to the very high and sustained rate of horizontal mobility which is characteristic of semiskilled workers.[48]

The increasing similarity of the work in factory and office is noted by Caplow, and particularly the similarity of require-

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ments in the form of a high-school diploma to provide the background of general familiarity with the commonplace routines of modern society:

> The characteristic jobs of machine operators in modern factories, of clerical workers in large offices, and of sales clerks, inspectors, and other minor functionaries require a general familiarity with technical and commercial operations, together with a minimum command of the number system, the written language, and the technic of operating such devices as automobiles and cash registers. Although the emphasis upon mechanical insight and manual dexterity is greater in the factory trades than in the office jobs, the two broad branches of semiskilled work tend to become increasingly alike in many ways. Movement from one to the other takes place very readily. Tests carefully devised to measure clerical aptitude sometimes turn out to be better indicators of mechanical aptitude, and vice versa. This is apparently explained by the fact that the tests are patterned after operations actually required in typical jobs, and that operations required in machine production and clerical work are often very similar.
>
> The modern technics of job classification and personnel selection, developed in connection with large-scale production, are designed above all to facilitate the interchangeability of personnel. One method of ensuring interchangeability is to reduce each complex operation to a series of simple operations which require no extraordinary ability. When this is done, an automatic effect is to standardize output throughout the series of related operations at a point well below the maximum output of which individual workers might be capable. At the same time, the formal qualifications required for employment are standardized by the educational process, so that there are comparatively few differences that matter between one worker and another.[49]

The problem of the so-called employee or white-collar worker which so bothered early generations of Marxists, and which was hailed by anti-Marxists as a proof of the falsity of the "proletarianization" thesis, has thus been unambiguously clarified by the polarization of office employment and the

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growth at one pole of an immense mass of *wage-workers.* The apparent trend to a large nonproletarian "middle class" has resolved itself into the creation of a large proletariat in a new form. In its conditions of employment, this working population has lost all former superiorities over workers in industry, and in its scales of pay it has sunk almost to the very bottom. But beneath them, in this latter respect at least, are the workers in service occupations and retail trade, whom we must consider next.

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12. Jon M. Shepard, *Automation and Alienation: A Study of Office and Factory Workers* (Cambridge, Mass., 1971), pp. 41–42.
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16. Galloway, *Office Management*, pp. 222–26.
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The Structure of the Working Class and its Reserve Armies

Labor and capital are the opposite poles of capitalist society. This polarity begins in each enterprise and is realized on a national and even international scale as a giant duality of classes which dominates the social structure. And yet this polarity is incorporated in a necessary identity between the two. Whatever its form, whether as money or commodities or means of production, *capital is labor:* it is labor that has been performed in the past, the objectified product of preceding phases of the cycle of production which becomes capital only through appropriation by the capitalist and its use in the accumulation of more capital. At the same time, as living labor which is purchased by the capitalist to set the production process into motion, *labor is capital.* That portion of money capital which is set aside for the payment of labor, the portion which in each cycle is converted into living labor power, is the portion of capital which stands for and corresponds to the working population, and upon which the latter subsists.

Before it is anything else, therefore, the working class is the animate part of capital, the part which will set in motion the process that yields to the total capital its increment of surplus value. As such, the working class is first of all raw material for exploitation.

This working class lives a social and political existence of its own, outside the direct grip of capital. It protests and submits, rebels or is integrated into bourgeois society, sees itself as a class or loses sight of its own existence, in accordance with the forces that act upon it and the moods, conjunctures, and conflicts of social and political life. But since, in its permanent existence, it is the living part of capital, its occupational

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structure, modes of work, and distribution through the industries of society are determined by the ongoing processes of the accumulation of capital. It is seized, released, flung into various parts of the social machinery and expelled by others, not in accord with its own will or self-activity, but in accord with the movement of capital.

From this is derived the formal definition of the working class as that class which, possessing nothing but its power to labor, sells that power to capital in return for its subsistence. As we shall see, this, like all definitions, is limited by its static quality. But in itself it is perfectly correct and forms the only adequate starting point for any attempt to visualize the working class in modern society.

We may gain a rough first approximation of the working class in this century by considering at the outset the mass occupational categories which embrace, with a few anomalies and exceptions, the unmistakably working-class population. These, as classified by the U.S. bureaus of the census and labor statistics, are the craftsmen, clerical workers, operatives, sales workers, service workers, and nonfarm laborers. We exclude from these groups foremen, who are usually classified in the craftsman's category; from among the sales workers, we exclude the salesmen, agents, and brokers of advertising, insurance, real estate, and stocks and bonds, as well as manufacturers' representatives and salesmen in wholesale trade, the latter being generally higher-paid and privileged sales workers, thus leaving in this category chiefly salespersons in retail trade.* In these six categories, so modified, we find the overwhelming bulk of the nonagricultural working class, whose growth and changes of composition can be seen in the table on the next page.[1]

* Since for our tabulation we use the census figures for the "economically active civilian population"—the term used in the early part of this century—or, in later censuses, the "experienced civilian labor force," this tabulation includes all workers whose occupations can be defined, employed or unemployed, but not those who have "dropped out of the labor force."

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	Workers (in millions) 1900–1970							
	1900	*1910*	*1920*	*1930*	*1940*	*1950*	*1960*	*1970*
Operatives and laborers	7.3	9.9	11.5	13.0	14.4	15.5	16.4	18.1
Craftsmen	2.9	4.0	5.0	5.7	5.6	7.3	8.0	9.5
Clerical workers	.9	2.0	3.4	4.3	5.0	7.1	9.6	14.3
Service and sales workers	3.6	4.9	4.9	7.3	8.8	8.7	10.6	13.4
Total workers	14.7	20.8	24.8	30.3	33.8	38.6	44.6	55.3
Total "active" or "experienced labor force"	29.0	37.3	42.2	48.7	51.7	57.9	64.5	80.0
	Workers (as percent of total "labor force")							
Percentage	**50.7**	**55.8**	**58.8**	**62.2**	**65.4**	**66.7**	**69.1**	**69.1**

Using major occupational categories in this way, even if modified as described, leaves much to be desired in statistical precision. For example, it has already been pointed out that even the lowest of the occupational categories included in this table—that of service workers—includes among its hundreds of thousands of cooks some who, as chefs, manage the labor processes of large kitchens, are paid on a managerial scale, and are thus strictly speaking far from being "working class" in the same sense as the rest of the category. The same is undoubtedly true of some who are classified as bookkeepers, or even secretaries, within the clerical category. One might also raise objections to the classification of police as workers. The numbers involved, however, are small in relation to the size of the categories as a whole. On the other hand, some parts of other major occupational groups not included in this tabulation are just as much a part of the unmistakable and self-evident working class as those major groups we have included above. In that group called "managers, officials, and proprietors," for instance, there are considerable numbers of

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railroad conductors, union officials, and especially "managers," so called, of retail stores, eating and drinking places, gasoline service stations, repair and personal services, and the like. In a large number of cases the classification of such workers as managers owes more to convention than to reality. The inclusion of draftsmen, medical, dental, engineering and other such technicians among the professional and technical grouping also, in a large and increasing number of cases, conceals a genuinely working-class situation for those involved.

Moreover, a very rapidly growing category reported in the census is that which falls outside of any occupational group and is given the rubric "occupation not reported." This category of the occupational census included 1,369,621 people in 1950, and 3,453,279 in 1960. Furthermore, the growing number of those who are not counted as part of the "labor force" because they have stopped the active search for employment, as well as the enormous undercounting of the population in the working-class portions of the cities now admitted by census officials, also affect the trends. All in all, we must suppose these forms of undercounting result, particularly in recent censuses, in an underestimate of the size of the working-class population. These considerations, rough though they may be, tend toward the conclusion that the nonagricultural working-class portion of the "experienced civilian labor force" has grown since the start of the century from half to well over two-thirds, perhaps as high as three-quarters, of the total at the present time.

The conversion of an ever larger proportion of the population into labor power on the working-class level devoted to the increase of capital, has taken place primarily at the expense of the farming population, which at the turn of the century embraced nearly 40 percent of the "economically active," while by 1970 it had fallen below 4 percent. The most substantial proportional increases have taken place in three categories: operatives, clerical workers, and the combined service and retail-sales sectors. As the employment effects of the technological revolution began to be felt, however, the

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steady proportional increase of operatives ceased, and after 1950 this group fell backward as a proportion of the total (although numerically it continued to increase). But the continued, and even accelerated, increase of the other two groups, clerical and sales-service, has taken up the workers released from factory employment (or never hired).

It takes but a moment's reflection to see that the new mass working-class occupations tend to grow, not in contradiction to the speedy mechanization and "automation" of industry, but in harmony with it. As a result of this mechanization, the numbers of workers required by the manufacturing, mining, transportation, communications, public utilities, and even to some extent construction industries are held down and do not increase as rapidly as their material products, so that the labor requirements of these industries, measured as a proportion of the total employed population, are held in check. Thus the scientific-technological revolution possesses, in the long run, this trait: that with its spread, the proportion of the population connected with scientifically and technologically advanced industry, even if only in the form of helots, eventually shrinks. The fastest growing industrial and occupational sectors in the "automated" age tend, therefore, in the long run to be those labor-intensive areas which have not yet been or cannot be subjected to high technology.

The masses of labor sloughed off by the rapid mechanization of industry (and this includes not just those who lose their jobs, but, much more important numerically, those who keep coming into the employment market at a time when traditional opportunities for industrial employment are shrinking) furnish the labor supply for the clerical, service, and sales fields. The mechanization of industry produces a relative surplus of population available for employment at the lower pay rates that characterize these new mass occupations. In other words, as capital moves into new fields in search of profitable investment, the laws of capital accumulation in the older fields operate to bring into existence the "labor force"

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required by capital in its new incarnations. This process was given its classic formulation by Marx in the chapter of the first volume of *Capital* called "The General Law of Capitalist Accumulation," in the section in which he describes the continuous formation in capitalist production, after it emerges from its "childhood," of a "relative surplus-population." We have already extracted a portion of this passage in Chapter 11, but since Marx's description of the movement of capital and labor in the nineteenth century is extraordinarily helpful for understanding our present theme, and since the matter can hardly be given a more forceful and precise formulation, it bears quotation here at greater length:

> But if a surplus labouring population is a necessary product of accumulation or of the development of wealth on a capitalist basis, this surplus-population becomes, conversely, the lever of capitalistic accumulation, nay, a condition of existence of the capitalist mode of production. It forms a disposable industrial reserve army, that belongs to capital quite as absolutely as if the latter had bred it at its own cost. Independently of the limits of the actual increase of population, it creates, for the changing needs of the self-expansion of capital, a mass of human material always ready for exploitation. With accumulation, and the development of the productiveness of labour that accompanies it, the power of sudden expansion of capital grows also; it grows, not merely because the elasticity of the capital already functioning increases, not merely because the absolute wealth of society expands, of which capital only forms an elastic part, not merely because credit, under every special stimulus, at once places an unusual part of this wealth at the disposal of production in the form of additional capital; it grows, also, because the technical conditions of the process of production themselves—machinery, means of transport, &c.—now admit of the rapidest transformation of masses of surplus-product into additional means of production. The mass of social wealth, overflowing with the advance of accumulation, and transformable into additional capital, thrusts itself frantically into old branches of production, whose market suddenly expands, or into newly formed branches, such as railways, &c., the need for which grows out of

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> the development of the old ones. In all such cases, there must be the possibility of throwing great masses of men* suddenly on the decisive points without injury to the scale of production in other spheres. Overpopulation supplies these masses. . . . This increase is effected by the simple process that constantly "sets free" a part of the labourers; by methods which lessen the number of labourers employed in proportion to the increased production. The whole form of the movement of modern industry depends, therefore, upon the constant transformation of a part of the labouring population into unemployed or half-employed hands.[2]

Those industries and labor processes subjected to mechanization release masses of labor for exploitation in other, generally less mechanized, areas of capital accumulation. With the repeated manifestations of this cycle, labor tends to pile up in the industries and occupations which are less susceptible to engineered improvements in labor productivity. Wage rates in these "new" industries and occupations are held down by the continuous availability of the relative surplus population created by the steadily increasing productivity of labor in the machine occupations. This in turn encourages the investment of capital in forms of the labor process which require masses of low-wage hand labor. As a result, we see in capitalist industry a secular trend to accumulate labor in those portions of industry and trade which are least affected by the scientific-technical revolution: service work, sales and other forms of marketing, clerical work insofar as it has not yet been mechanized, etc. The paradox that the most rapidly growing mass occupations in an era of scientific-technical revolution are those which have least to do with science and technology need not surprise us. The purpose of machinery is not to

* Marx here uses the word *Menschenmassen,* which in this context would more properly translate as "human masses" or "masses of people." Since the masses dragooned for the new branches of capitalist industry are now more often *women* than *men,* it is all the more necessary to call attention to the male linguistic bias which in this case, as in others, has affected the translation of Marx.

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increase but to decrease the number of workers attached to it. Thus it is by no means illogical that with the development of science and technology, the numbers of those cheaply available for dancing attendance upon capital in all of its least mechanized functional forms continues to increase at a rapid pace.

In periods of rapid capital accumulation, such as that which has taken place throughout the capitalist world since World War II, the relative surplus population which is the "natural" product of the capital accumulation process is supplemented with other sources of labor. In northern Europe and the United States, the capitalist economies have increasingly made use of the masses of former agricultural labor in the colonies and neocolonies. These masses are thrown off by the process of imperialist penetration itself, which has disrupted the traditional forms of labor and subsistence. They become available to capital as its own agricultural surplus labor (that part of the relative surplus population which Marx called the "latent" portion) is used up. As a result of this, the movement of labor has to some extent become internationalized, although still regulated in each country by government action in an attempt to make it conform to the national needs of capital. Thus Western Europe and the United States now draw upon a labor reservoir which extends in a broad band from India and Pakistan in the east across northern Africa and southernmost Europe all the way to the Caribbean and other portions of Latin America in the west. Indian, Pakistani, Turkish, Greek, Italian, African, Spanish, West Indian, and other workers supplement the indigenous underclass in northern Europe and make up its lowest layers. In the United States, the same role is occupied by Puerto Rican, Mexican, and other Latin American workers, who have been added to the pool of lowest-paid labor which is made up chiefly of black workers.

At the same time, in a process which cuts across racial and national lines, the female portion of the population has become the prime supplementary reservoir of labor. In all the most rapidly growing sectors of the working class, women

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make up the majority, and in some instances the overwhelming majority, of the workers. Women form the ideal reservoir of labor for the new mass occupations. The barrier which confines women to much lower pay scales is reinforced by the vast numbers in which they are available to capital. These vast numbers are in turn guaranteed, for a considerable period of time, by the lower rate of participation in the working population with which women entered into the era of monopoly capital. While the male population, even in its prime working ages, is suffering a slowly declining labor force participation rate (which is only a concealed form of the rise in unemployment), women have been participating in employment at a very rapidly rising rate throughout this century. For capital, this is an expression of the movement to the poorly paid, menial, and "supplementary" occupations. For the working class, it is in part an expression of the increasing difficulty of keeping up with customary and unavoidable needs of subsistence in the society created by capital, without having two or more family members at work at the same time. In this manner, an ever increasing portion of human work is incorporated into capital.

The Reserve Army of Labor

Thus the mass of employment cannot be separated from its associated mass of unemployment. Under conditions of capitalism, unemployment is not an aberration but a necessary part of the working mechanism of the capitalist mode of production. It is continuously produced and absorbed by the energy of the accumulation process itself. And unemployment is only the officially counted part of the relative surplus of working population which is necessary for the accumulation of capital and which is itself produced by it. This relative surplus population, the industrial reserve army, takes a variety of forms in modern society, including the unemployed; the sporadically employed; the part-time employed; the mass of women who, as houseworkers, form a reserve for the "female

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occupations"; the armies of migrant labor, both agricultural and industrial; the black population with its extraordinarily high rates of unemployment; and the foreign reserves of labor.

Marx distinguished three forms of the reserve army of labor, or relative surplus population: the floating, the latent, and the stagnant. The *floating* form is found in the centers of industry and employment, in the form of workers who move from job to job, attracted and repelled (that is to say, hired and discarded) by the movements of technology and capital, and suffering a certain amount of unemployment in the course of this motion. With the simplification of job operations and the spread of the number and variety of jobs for which the "qualifications" have become reduced to the minimums of simple labor, this stratum has grown to encompass large parts of the working population. The extraordinary mobility provided by automobile transport in the United States has widened the geographical range of such jobs for each worker, has greatly enlarged the "labor pool" available to each factory, office, warehouse, retail establishment, etc., and has broken down ties to localities and communities. An ordinary working life for many workers now consists of movement among a considerable number of jobs, so that such workers are in turn part of the employed and the reserve labor populations. This has been reflected in the system of unemployment insurance, which provides for periods of unemployment at a reduced wage with monies collected during periods of employment; it is in part a safeguard against the economic, social, and political effects of widespread and prolonged unemployment, and in part a recognition of the roles workers play, now as part of the employed and now as part of the reserve armies of labor.

The *latent* relative surplus population is, in Marx's definition, that which is found in the agricultural areas. In these areas, unlike in the centers of capitalist industry, there exists no counter-movement of attraction to offset the repulsion of those "set free" by the revolution in agricultural technology, and hence the movement of labor is out of the agricultural regions and into the cities or metropolitan areas. In the most

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developed capitalist countries in northern Europe and North America, this pool of latent relative surplus population has been largely absorbed, although in the United States the black population of the rural areas still remains, in dwindling numbers, as part of this pool. The latent form of surplus population now exists chiefly in the neocolonies, and, as has been noted, the capitalist countries attempt a regulated absorption and repulsion of such labor, in accord with the needs of accumulation. This regulated internationalization of the labor market is supplemented by the export of various industrial processes to cheap labor areas in the countries which are kept in subjugation as "undeveloped regions."

Finally, Marx speaks of the *stagnant* relative surplus population, whose employment is irregular, casual, marginal, and which merges with the "sediment," as Marx called it, of relative surplus population which dwells in the world of pauperism: "Pauperism is the hospital of the active labour-army and the dead weight of the industrial reserve army . . . ; along with the surplus-population, pauperism forms a condition of capitalist production, and of the capitalist development of wealth. It enters into the *faux frais* of capitalist production; but capital knows how to throw these, for the most part, from its own shoulders on to those of the working class and the lower middle class." [3]

The stagnant relative surplus population, irregularly and casually employed, "furnishes to capital," in Marx's words, "an inexhaustible reservoir of disposable labour-power. Its conditions of life sink below the average normal level of the working-class; this makes it at once the broad basis of special branches of capitalist exploitation." [4] The importance of this branch of surplus population for the types of employment that have been increasing rapidly is clear. We will consider it at greater length below.

The activity of capital in breeding masses of labor for its various needs is summarized by Marx in the following familiar paragraph:

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> The greater the social wealth, the functioning capital, the extent and energy of its growth, and, therefore, also the absolute mass of the proletariat and the productiveness of its labour, the greater is the industrial reserve army. The same causes which develop the expansive power of capital, develop also the labour-power at its disposal. The relative mass of the industrial reserve army increases therefore with the potential energy of wealth. But the greater this reserve army in proportion to the active labour-army, the greater is the mass of a consolidated surplus-population, whose misery is in inverse ratio to its torment of labour. The more extensive, finally, the lazarus-layers of the working-class, and the industrial reserve army, the greater is official pauperism. *This is the absolute general law of capitalist accumulation.* Like all other laws it is modified in its working by many circumstances, the analysis of which does not concern us here.[5]

This law, Marx maintained, "always equilibrates the relative surplus-population, or industrial reserve army, to the extent and energy of accumulation. . . . It establishes an accumulation of misery, corresponding with the accumulation of capital."[6] During the 1940s and early 1950s, when the tendencies of the immense upward surge in the accumulation of capital that began (for the United States) in the Second World War were not yet developed or clearly manifest, this "absolute general law of capitalist accumulation" was widely taken to be the weakest aspect of the Marxian analysis. From our present vantage point, when the consequences of this cycle of accumulation have worked themselves out more fully and have been given greater visibility by the unrest of the 1960s, the matter takes on a somewhat different appearance.

The scope and energy of the accumulation process that began at the start of the 1940s has completed the annihilation of the agricultural population in the United States and largely transformed it, black and white alike, into an urban "labor force," and this has been supplemented by the import of workers on a considerable scale from Latin America. This immense increase in "the absolute mass of the proletariat" has

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been accompanied by an equally immense increase in the industrial reserve army. Statistics show a doubling of the number of officially counted unemployed, so that in the early 1970s this part of the working class had mounted into the 4 to 5 million range, but this is the least significant indicator of the growth of the industrial reserve army. Far more significant is the statistical series known as the "labor force participation rate."

This series attempts to establish, by the technique of household sampling interviews, the proportion of the population which is part of the labor market. It starts from the assumption that some significant part of the population over the age of sixteen cannot be counted as part of the "labor force" because it is made up of people who are in school, running a household full time, sick or disabled, or retired for reasons of age. All these categories of presumed nonseekers after employment are obviously elastic: when one considers that the total embraced in this "not-in-the-labor-force" group exceeded 55 million persons in 1971, there is clearly plenty of room in it for concealed unemployment—all the more so as it also includes those who are not seeking work because they believe they cannot find it. This conclusion is confirmed by the fact that some 4 to 5 million persons in the group, in the last years of the 1960s and the early 1970s, regularly expressed themselves as "wanting a job now," although they are counted as not having been part of the labor force for the preceding period. This alone either doubles or more than doubles the official unemployment rate in most of those years.[7]*

The movement of the labor force participation rate in the years since World War II, *taken as a whole,* is a relatively unenlightening trend. The percent of the noninstitutionalized population found in the total labor force (including the armed forces) has moved since 1947 in a narrow range between 59

* This conclusion is also arrived at, by other and much fuller methods of computation, by Paul Sweezy and Harry Magdoff in their analysis of the labor force participation rate in *Monthly Review.*[8]

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and 61 percent. But this static condition conceals changes of a most striking kind, which become visible as soon as one breaks down the overall figures by sex. The nonmovement of the index as a whole is produced by violently contrary movements of the male and female populations.[9]

For the male population during the period 1947 to 1971, a strong and consistent decline since the 1940s and early 1950s has reduced the participation rate from some 87 percent to only 80 percent. This decline is only partly attributable to the increase in school attendance during the student years; it is to be found in every age category, and is most particularly marked in male workers between the ages of 55 and 64, for whom the participation rate declined from 89.6 in 1947 to 82.2 in 1971. Unless we are to make untenable assumptions (such as, as Sweezy and Magdoff point out, the assumption of a growing leisure class among workers), this clearly indicates that a portion of the male working population (and the figures point to white workers almost as much as to black) has been and is being moved into the reserve army of labor without this showing up in the unemployment statistics.

For the female population, the trend is precisely the opposite. Here the figures, across the board for all age groups, indicate a very great movement *into* the labor force, from a participation rate of 31.8 percent in 1947 to 43.4 percent in 1971. And just as among males the largest decrease takes place in the 55- to 64-year-old age bracket, so among females the largest *increase* takes place in the age groups from 45 to 54 and from 55 to 64; for the former, from 32.7 percent in 1947 to 54.3 percent in 1971, and for the latter, from 24.3 percent to 42.9 percent.

These two opposing statistical movements of male and female workers are contradictory in form only. In essence, they represent two sides of the same phenomenon, the increase in the relative mass of the industrial reserve army. Among male workers this takes the form of a sloughing off into the ranks of the so-called nonparticipants in the labor force, or in other words an increase of the "stagnant" portion. Among female

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workers it takes the form of a growing body of female labor which is drawn from the mass of women who previously did not work, and hence represents an enlargement of the "floating" and "stagnant" reserve army of labor by additional hundreds of thousands and even millions each year. As the available pool of unemployed labor is expanded among men by their relative *repulsion* from industry and trade, it is expanded even more among women by their increasing *attraction* into industry and trade. The opposing forms taken by this basically unitary movement simply reflect the different starting points of male and female labor at the beginning of the period we have been considering, as well as the strong demand for female labor in the expanding mass occupations in contrast to the relative stagnation of the male mass occupations.

The logical culmination of these trends is an equalization of the labor force participation rates between men and women, and the stabilization of a uniform rate for the population as a whole—in other words, the transformation of as much as one-third or more of the male population into a reserve army of labor, along with a similar part of the female population. But for purposes of this analysis there is no need to enter into risky extrapolations from existing statistical trends. It is enough to notice *what has in fact been happening*, without trying to assess the extent to which it can proceed, an extent which is limited by future trends in the accumulation process of capital as well as by social trends having to do with the structure of the family, etc. And what has been happening is that, along with an increasing mass of the proletariat, there is also the consolidation of an increasing mass of relative surplus population which takes place by way of a market repulsion of male labor and an attraction of female labor, both on a very great scale.

The well-established fact that women are generally paid on a substantially lower scale than men, either by way of their concentration in lower-paid occupations or within the same occupation, immediately draws our attention to a significant

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long-term consequence of the statistical movement we have been discussing. The concentration of better-paid employment among craftsmen (as well as professional and managerial males) on the one side, and the further tendency of the mass of working-class jobs to shift in the direction of lower-paid female occupations, clearly brings about a polarization of income among job holders. This is reflected in the fact that the industrial sectors in the United States in which employment is relatively stagnant are the sectors with wage rates above the average, while the sectors in which employment is growing most rapidly are those with lower-than-average wage rates:[10]

Gross Average Weekly Earnings of Production or Nonsupervisory Workers on Private Nonagricultural Payrolls, 1971

Relatively stagnant industries		*Rapidly growing industries*	
Mining	$171.74	Wholesale and retail trade	$100.74
Contract construction	212.24	Finance, insurance, and real estate	121.36
Manufacturing	142.04	Service industries	102.94
Transportation and public utilities	168.84		

An important corroboration of this trend toward a polarization of income among job holders emerges from the work of Victor R. Fuchs for the National Bureau of Economic Research. Fuchs is a celebrant of the growing importance of the service industries, and the information we shall cite here arose as a by-product of his effort to establish the shift to service industries and the consequent characteristics of the emerging economic structure. He divided the economy into two sectors. The first, which he called "Industry," included mining, construction, manufacturing, transport, communications and public utilities, and government enterprises. The second, which he called "Service," included wholesale trade, retail trade, finance and insurance, real estate, and household and institutional employment, professional, personal, business,

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repair services, and general government including the armed forces.

The rationale of such a separation, and the significance of the results obtained by making these particular groupings, does not here concern us; this I have already discussed in the chapters on the universal market and on the service and retail-trade occupations. What is interesting at this point is that these groupings correspond precisely to the stagnating and the growing portions of the American economy. Each of the industrial classifications listed by Fuchs as belonging to Industry has been either stagnating or declining in terms of the percentage of national employment it represents, and this is true for *every* classification in the group since the 1950s and for *almost every* classification since the 1920s. On the other side, *every* classification (except household employment) included by Fuchs in the Service sector has been a rapidly growing area of employment throughout the last hundred years, again in terms of its percentage of total employment.[11] The Service sector, as defined by Fuchs, grew from approximately 40 percent of total employment in 1929 to over 55 percent in 1967. Between 1947 and 1965 alone, there was an increase of 13 million jobs in this sector, compared with an increase of only 4 million in the Industry sector.* [12]

The most striking finding reported by Fuchs is the growing gap between the pay levels in the Industry sector and those in

* This increase, we may note in passing, was not, according to Fuchs, accompanied by any increase in the share of output produced in the Service sector. Measured as a share in Gross National Product, the output of the Service sector did not increase at all between 1929 and 1965, despite the great increase in its share of employment.[13] This estimate is interesting, as far as it goes, in highlighting the increasingly wasteful allocation of labor, but since Fuchs is bound by the fictitious concepts of "output" used in calculating the Gross National Product, it does not go nearly as far as it should. The "output" of great portions of the Service sector exists only in the balance sheets of the corporations operating within it, and in the national product accounts of statisticians and economists, while adding little or nothing to the social product calculated in noncapitalist terms.

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the Service sector. With remarkable consistency, the average rates of pay in the Service sector each year slipped further behind the average rates of pay in the Industry sector, so that by 1959 Industry rates were on the average 17 percent higher, and thereafter the gap continued to widen.[14] Since the Service sector employs a disproportionately large share of nonwhite, female, and very young workers, Fuchs next investigates whether this widening wage gap is perhaps simply the effect of the contrasting compositions of the two sectors, by color, age, sex, and education—in other words, whether it is not just another way of looking at the well-known fact that blacks, women, young workers, etc., receive less pay. This proves to be only part of the explanation: the differing compositions of the two sectors of employment "explain" only about one-half the great and growing spread in pay. This means that while the Service sector contains a disproportionate share of those who, throughout the whole economy, get lower pay, and this pulls down the average for the sector, at the same time *all* kinds of workers in the Service sector, no matter what their age, color, or sex, receive on the average lower rates of pay.* [15]

The levels of pay in the low-wage industries and occupations are below the subsistence level; that is to say, unlike the scales of the highest paid occupational groups, they do not approach the income required to support a family at the levels of spending necessary in modern society. But, because these industries and occupations are also the most rapidly growing

* Another investigation of the same subject matter, by Barry Bluestone, reaches this conclusion: "In tracing wage histories since the Second World War, one finds that the wage differential between 'high-wage' and 'low-wage' industries has increased secularly. In 1947 the set of industries with lowest wages paid straight-time hourly rates which averaged 75 percent of the average wages prevailing in the highest wage industries in the nation. Apart from slight cyclical variation in wage increases during the ensuing period, the wage ratio between these two sets of industries fell to 60 percent by 1966. The low-wage industries granted smaller wage increases (in percentage as well as absolute terms) in all but four years during the two-decade period." [16]

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ones, an ever larger mass of workers has become dependent upon them as the sole source of support for their families. It is this continual enlargement of the mass of lower-paid occupations that is at the root of the tendencies, which began to be publicized only during the 1960s but which existed before, toward "poverty in the midst of plenty" in the United States; it is this that accounts for the rapid expansion of the welfare rolls to take in ever larger masses of *employed* workers.

This tendency, which is but one of the factors leading to what Marx called an "accumulation of misery, corresponding to the accumulation of capital," is so marked that even when one abstracts from the effects of the rapid influx of female labor into ill-paid employment and considers only male employment, it is still visible and measurable. A study of the distribution of earned income made by Peter Henle of the U.S. Department of Labor follows the widespread custom of disregarding female employment, which is considered to be somehow temporary, incidental, and fortuitous, when it should actually be placed at the very center of all occupational studies today. Henle considers only the distribution of earned income among males, and his conclusion for the years 1958 to 1970 is as follows: "Over the 12-year span covered by this study, there has been a slow but persistent trend toward inequality in the distribution of earnings and in the distribution of wages and salaries. The trend is evident not only for the work force as a whole, but also for many individual occupational and industrial groups. If the effect of fringe benefits could have been included in the calculations, the trend would undoubtedly have been even more pronounced." "All in all," he notes, "the net effect of the shifting occupational composition of the economy seems clearly in the direction of a more elongated earnings distribution, helping to produce the trend toward inequality." [17] But the "shifting occupational and industrial composition of the economy" is far less significant for the male population alone; it is female employment, as has been noted, that accounts for the bulk of the occupational and industrial shift, and thus it is female employment that

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constitutes the bulk of the new working-class occupations. We cannot doubt, therefore, that if Henle's analysis were repeated for the total of the wage and salary earning population, it would show a rapid and intense, rather than a slow, trend toward polarization of income.

The problem of immense numbers of jobs which pay less than a "living wage," that is to say, less than the wage necessary to support a working-class family, to provide for the subsistence and reproduction of labor power, is, it is often assumed, resolved by the fact that multiple job holding within the same family is widely practiced. Indeed, in one way this must temper the problem, since the average number of jobs per family is between one-and-a-half and two, and this provides more income to many family units, although it increases the level of spending necessary for subsistence. But when one reflects upon the modes of life brought into being by this rapid change, and the tensions which result from the fact that millions of families are driven to multiple job holding in the absence of suitable conditions for child care, household care, etc., such a conclusion is far from certain. Surveys point out that discontent among workers goes up sharply in families that have more than one wage earner, despite the fact that income also goes up.[18] Further, there is another factor that influences any conclusion here, and that is the existence of a large number of families that have difficulty keeping even one family member occupied full time. An article on the crisis of the underemployed in the *New York Times Magazine* points out:

> It is true that, nationwide, the *average* family has 1.7 full-time equivalent workers. But the majority of *low-income* families in America are unable to *find* enough work to occupy more than one "full-time-equivalent" member. In 1970, the average number of "full-time-equivalent" workers per low-income family was *less than one!* In other words, one person (usually the male head) worked nearly (but not totally) full time, or several family members worked, but very sporadically. It is therefore useless—and cynical—to tell those for whom jobs do not exist that they could relieve their poverty if only they would be more willing to work.[19]

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That portion of the relative surplus population which Marx called "stagnant," irregularly employed and living in conditions of life that have fallen below the average normal level of the working class, and furnishing a "broad basis" for "special branches of capitalist exploitation," has grown to encompass huge proportions of the inner-city populations, considerable numbers in the depressed rural areas, and is on the increase in suburban regions. Its extent, at least in the core areas of the large cities of the United States, was carefully measured during the 1970 census by means of a questionnaire designed to study the relation between poverty and the job market. This Census Employment Survey (C.E.S.) produced some sixty-eight volumes of raw statistics, the analysis of which has been undertaken by the Subcommittee on Employment, Manpower, and Poverty of the United States Senate. The above-quoted article on underemployment, one of whose three authors is a staff member of that subcommittee, offers a summary of some of the findings of the C.E.S., and in particular of the effort to develop what is called a "subemployment index":

> The failure of the social and economic system to provide people with adequate wages is hidden from view under the surface of traditional unemployment statistics. These statistics are excellent for measuring fluctuations in the economy but they do not go far enough as measures of the labor market. To gauge the degree of labor-market failure, it is necessary to know not only the magnitude of overt unemployment, but also the extent of worker discouragement ("discouraged workers" are those who have given up looking for jobs); the number of people who can find only part-time work; and the number who hold jobs but at inadequate pay. The subemployment index attempts to encompass all these factors.
>
> In 1970, nationwide unemployment amounted to 4.9 per cent of the labor force (since then, it has hovered close to the 6 per cent mark month after month). In the C.E.S. central-city survey areas, the unemployment rate in 1970 was 9.6 per cent. This is *very* high. In France, the labor unions took to the streets last February when unemployment reached 2.6 per cent. But as

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high as it is here, the employment rate alone falls far short of revealing the full extent of urban crisis. When we look at the official definition of unemployment, we note that one cannot be "unemployed" unless one is currently looking for a job. It does not count those people who have given up looking for jobs after failing repeatedly to find work.

How many such discouraged nonseekers are there? The C.E.S. enables us to make a dependable estimate. For example, in New York City, the conventional unemployment rate in 1970 averaged 8.1 per cent in the survey areas (compared with 4.4 per cent for the labor force of the city as a whole), but jumped to 11 per cent when the discouraged workers were added.

This adjustment begins to give us a picture of realities of economic life at the bottom of a city's social structure. But to this we must now add another category—part-time employed workers who would like to work full time but cannot find full-time jobs. The C.E.S. survey carefully separates people who *wanted* to work only part time from those who wanted to work full time, and in this way adds (again, for New York) another 2.3 percentage points to our emerging index of urban poverty. In other words, adding together the officially unemployed, the discouraged jobless and the involuntary part-time workers, we can now account for at least 13.3 per cent of the labor force in the New York City sample areas.

Our adjustments have nearly doubled the official unemployment figures for the sample areas and tripled the national rate of unemployment. But, still, they are far from complete. The last and most important part of the index is the worker who has a full-time job but does not earn enough to make ends meet.[20]

For a definition of the income needed to "make ends meet," the authors go to the Bureau of Labor Statistics' itemized budget of consumption needs for a family of four in New York City. The Bureau compiled three such budgets, for the upper level at about $19,000, for the middle level at about $12,000, and for the lower levels at about $7,000, all before taxes. The nature of the lower-level budget may be judged from the fact that it allows only $100 a month for rent; all the rest of the budgeting is in line with this.

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> If we accept the B.L.S. figure of $7,183 as the least a family of four must earn to keep its head above water in New York City in 1970 (the B.L.S.'s national urban average for 1970 was $6,960), what does this require for the family's income earner? If he or she works 50 weeks a year, 40 hours a week (which is itself unlikely in the inner city), the answer is $3.50 an hour. Here is the final link in our chain of employment statistics. For when we add those individuals who earn less than $3.50 an hour to the discouraged nonseekers, the involuntary part-timers and the officially unemployed, the statistics take a horrifying leap. In the seven New York City sample areas, the subemployment rate rises to between 39.9 per cent and 66.6 per cent of the labor force. Indeed, the average for all the sampled areas in the country comes to 61.2 per cent.[21]

What other result could have been expected, when, as we have seen, in May 1971 the median usual weekly earnings of full-time workers in *all occupational categories of the working class with the exception only of craftsmen and foremen were far below this minimal earnings level,* and when the fastest growing occupational categories, those of clerical and service workers, were lowest of all?

Finally, the immense reservoir of subemployed labor holds on its lowest levels the pauperized layers of the population, that bottom sediment which is drawn into employment only infrequently, sporadically, and at peaks of "prosperity." "The more extensive, finally, the lazarus-layers of the working-class," Marx wrote, "and the industrial reserve army, the greater is official pauperism." According to his figures, the official list of paupers in England and Wales in 1865 was 971,433, and since the population count in the 1861 census was just over 20 million, official pauperism then constituted some 4.6 percent of the total population. In the United States, the closest thing we have to an official paupers' list is the roll of those requiring welfare assistance. In 1973, these rolls contained 14.8 million persons out of a total population of 210.4 million or 7 percent of the population (and 1973 was the fourth successive year when 7 percent or more of the

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population was to be found on the welfare rolls).[22] In this startling proportion one may see the post-World War II "prosperity" cycle in accordance with Marx's absolute general law of capitalist accumulation: the immense mass of social wealth and functioning capital, the extent and energy of capital accumulation, the growth of the absolute mass of the proletariat and the productiveness of its labor, the increasing relative mass of the industrial reserve army, of the mass of consolidated surplus population, and finally, the misery of "official pauperism." That this is a chain in which each link presupposes the rest, and in which "accumulation of wealth at one pole is, therefore, at the same time accumulation of misery" at the other, may no longer be doubted.

Notes

1. Alba Edwards, Sixteenth Census Reports, *Comparative Occupation Statistics for the United States, 1870 to 1940* (Washington, 1943), chapter XIII; David L. Kaplan and M. Claire Casey, *Occupational Trends in the United States: 1900 to 1950,* Bureau of the Census Working Paper No. 5 (Washington, 1958); U.S. Bureau of the Census, *U.S. Census of the Population: 1960,* vol. I (Washington, 1964), Part I, Table 201, p. 522; U.S. Bureau of the Census, *U.S. Census of the Population: 1970,* Final Report PC(2)–7A, Occupational Characteristics (Washington, 1973), Table 1.
2. Karl Marx, *Capital,* vol. I (Moscow, n.d.), pp. 592–93.
3. Ibid., p. 603.
4. Ibid., p. 602.
5. Ibid., p. 603.
6. Ibid., p. 604.
7. *Manpower Report of the President, March 1972,* Table A–8, p. 167.
8. Paul M. Sweezy and Harry Magdoff, "Economic Stagnation and Stagnation of Economics," *Monthly Review* (April 1971), pp. 1–11.
9. *Manpower Report of the President, March 1972,* Table A-1, p. 157; Table A-2, pp. 158–59.
10. *Monthly Labor Review* (December 1972), Table 22, p. 96.
11. Victor R. Fuchs, *The Service Economy* (New York and London, 1968), p. 19.
12. Ibid., p. 2.

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13. Ibid., pp. 19, 37.
14. Ibid., pp. 61, 129, 156.
15. Ibid., chapter 6.
16. Barry Bluestone, "Capitalism and Poverty in America: A Discussion," *Monthly Review* (June 1972), pp. 66–67.
17. Peter Henle, "Exploring the Distribution of Earned Income," *Monthly Labor Review* (December 1972), pp. 23–25.
18. Harold L. Sheppard and Neal Q. Herrick, *Where Have All the Robots Gone?: Worker Dissatisfaction in the '70s* (New York and London, 1972), pp. 25–27.
19. William Spring, Bennett Harrison, and Thomas Vietorisz, "In Much of the Inner City 60% Don't Earn Enough for a Decent Standard of Living," *New York Times Magazine,* November 5, 1972, p. 48.
20. Ibid., pp. 43–44.
21. Ibid., pp. 46–48.
22. Marx, *Capital,* pp. 611–12; *New York Times,* October 31, 1973.

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(*Continued from inside front cover*)

added a section with current *new* books of interest to its clientele. "In this connection," they write, "we would like to stock practically all MR Press titles. . . . We would like to have your cooperation by carrying a notice in MR that we stock all your titles as well as the magazine." Delighted to hear it and glad to oblige.

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A reader has pointed out to us that a couple of errors crept into the April Review of the Month ("Keynesian Chickens Come Home to Roost"): (1) The page number in the source note to Table 1 (p. 4) should read 311 rather than 31; and (2) the page number in the source note to Table 4 (p. 7) should read 324 rather than 123. À propos of the same Review of the Month another reader writes that he liked it and adds: "When I was an undergraduate I took lots of economics courses (all Keynesian) and only after several years of exposure and the war did it occur to me that they ask questions that are of interest only to the managers of the economy. Since that initial stroke of genius I have begun to learn the delights of political economy Marxist style. It took me a long time to purge myself of those years of Keynesian study, so now I delight in poking fun at them." Good implied advice to all brainwashed Keynesians!

We acknowledge with gratitude a generous contribution to MR Associates in memory of the late Fritz Pappenheim on his birthday, May 18th, by his widow Yvonne Pappenheim. Fritz, a dedicated socialist and stalwart anti-fascist fighter since before Hitler's accession to power in his native Germany, was the author of *The Alienation of Modern Man,* an MR Press book which continues to sell ten years after its author's death.

From time to time we receive a bequest from a reader who felt, in his or her lifetime, that financial support would make possible the continuance of MR as a completely independent socialist magazine. Any readers who may be moved to follow this example should be careful to state exactly, in their wills, that the bequest is to Monthly Review, Inc., of 62 West 14th Street, New York, N.Y. 10011.

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